

FIG. 1A

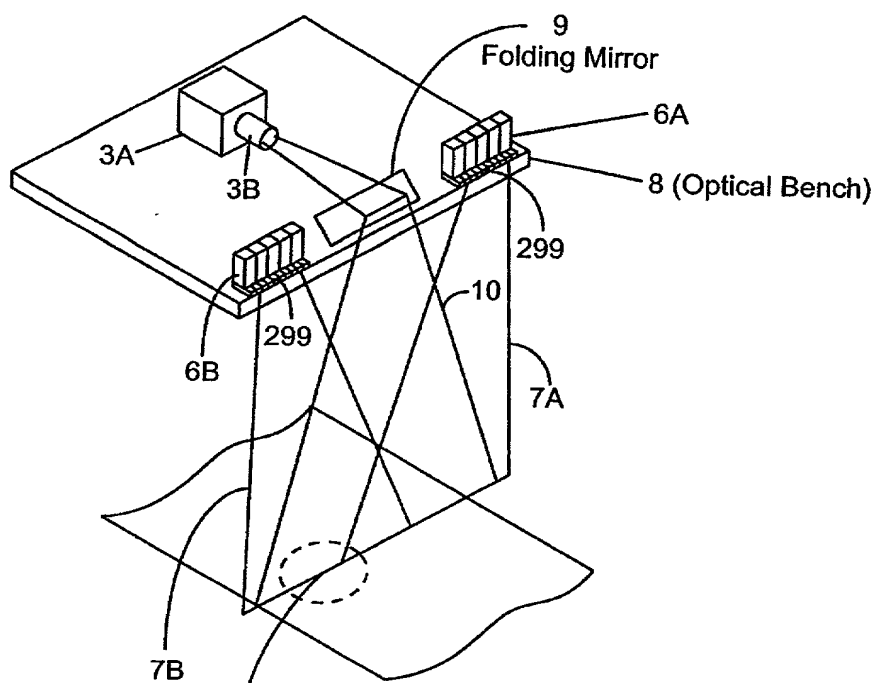


FIG. 1B1

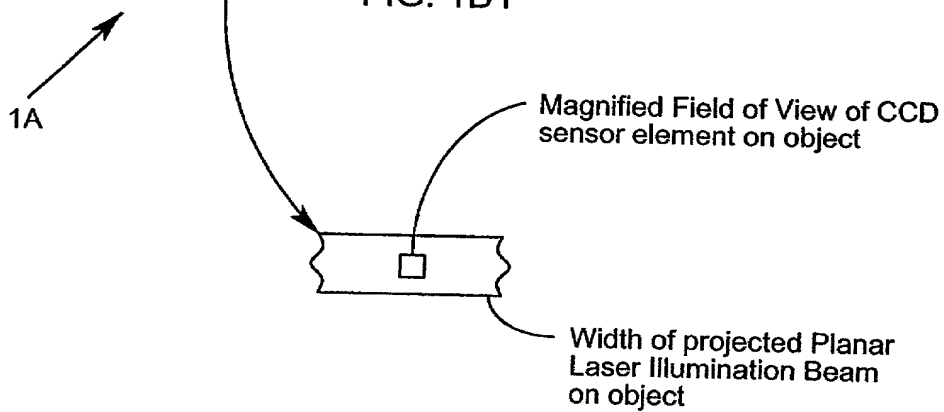


FIG. 1B3

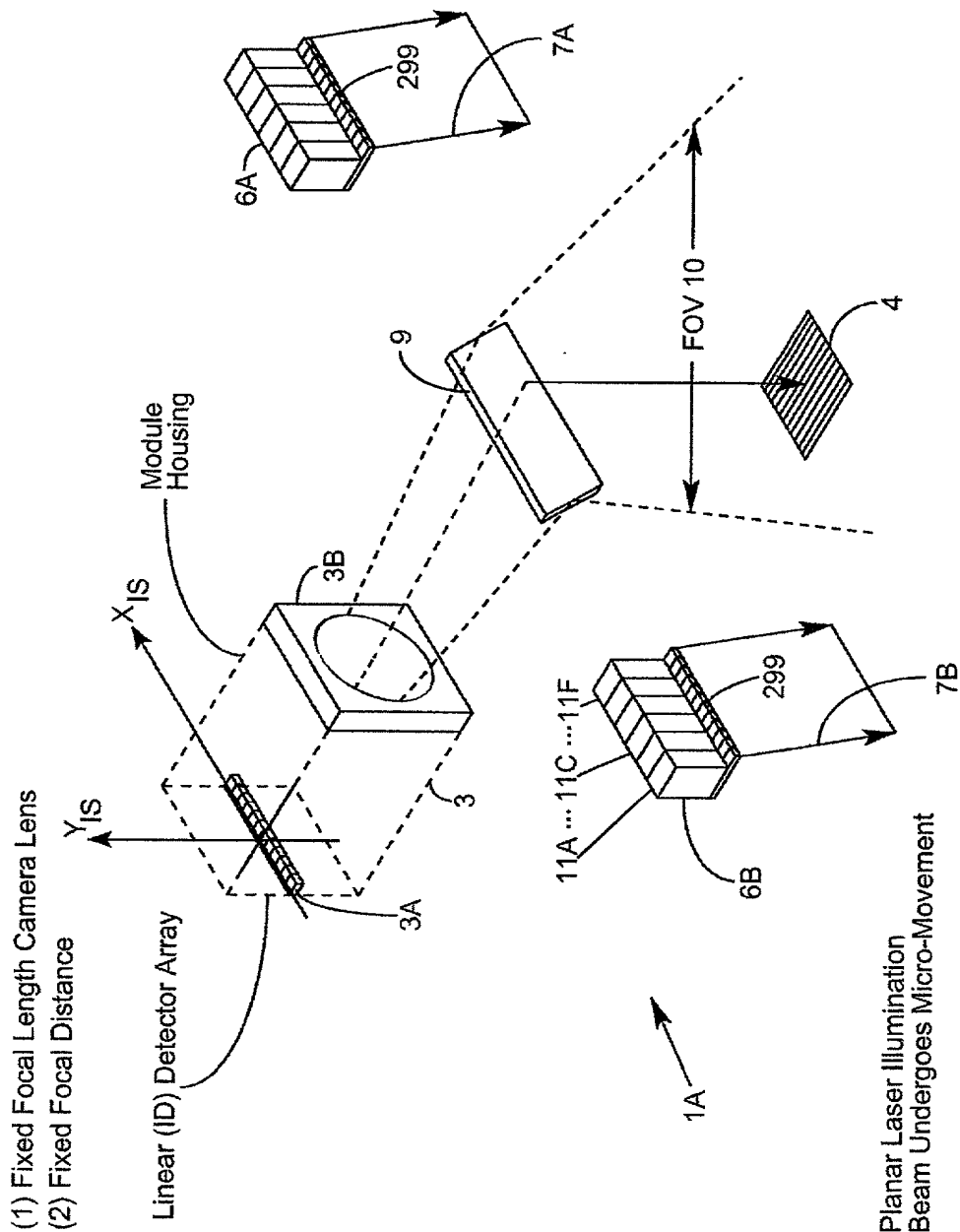


FIG. 1B2

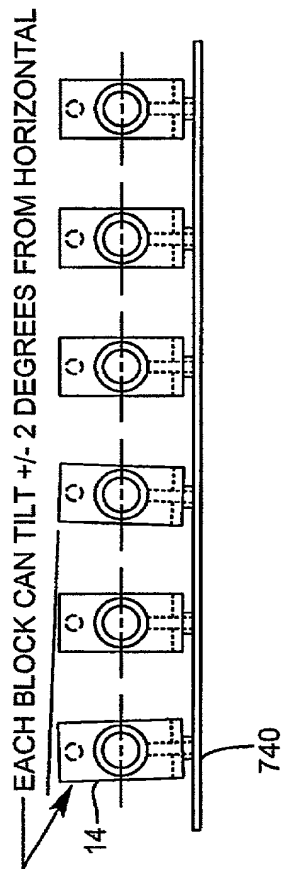


FIG. 1B4

VLD BLOCK CAN PITCH FORWARD FOR ALIGNMENT WITH OTHER VLD BEAMS

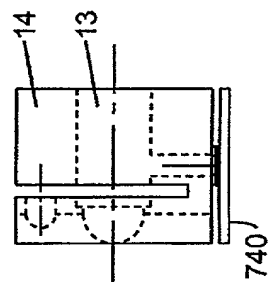


FIG. 1B5



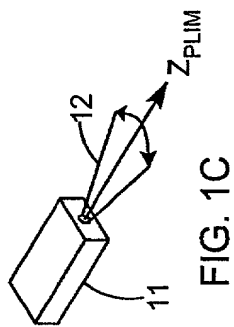


FIG. 1C

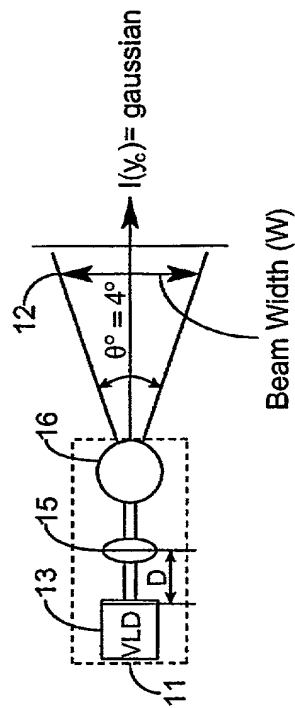


FIG. 1E1

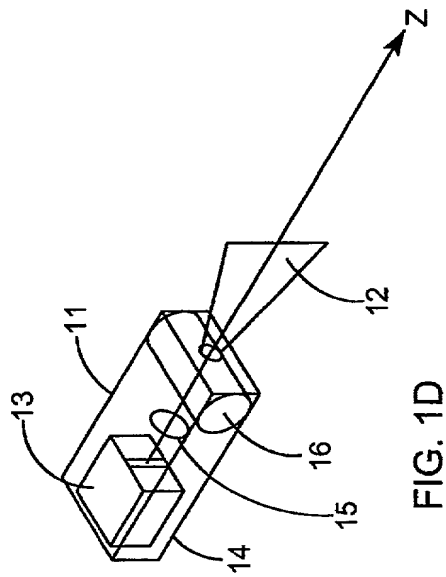
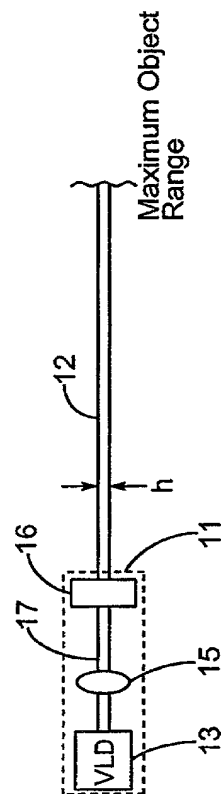


FIG. 1D



**FIG. 1E2**

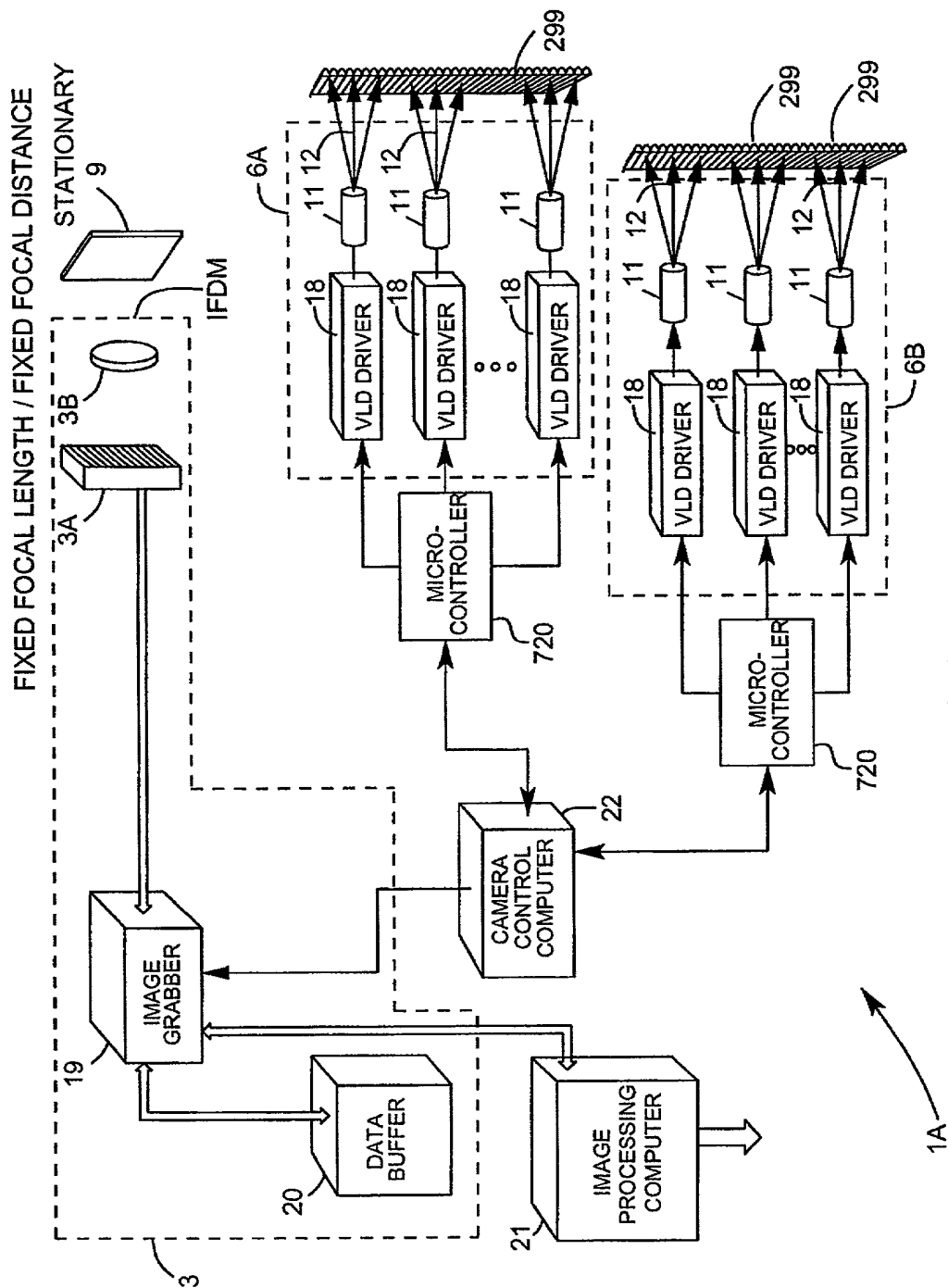


FIG. 1F

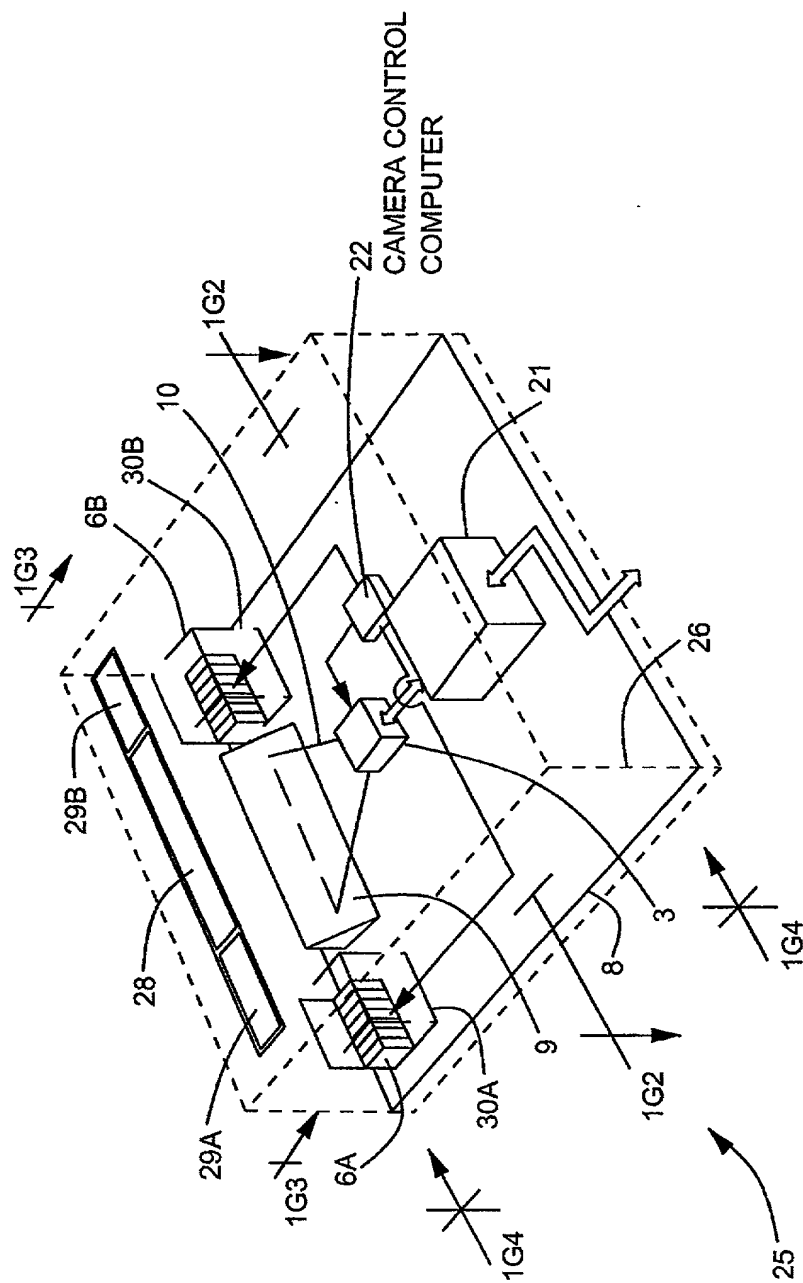


FIG. 1G1

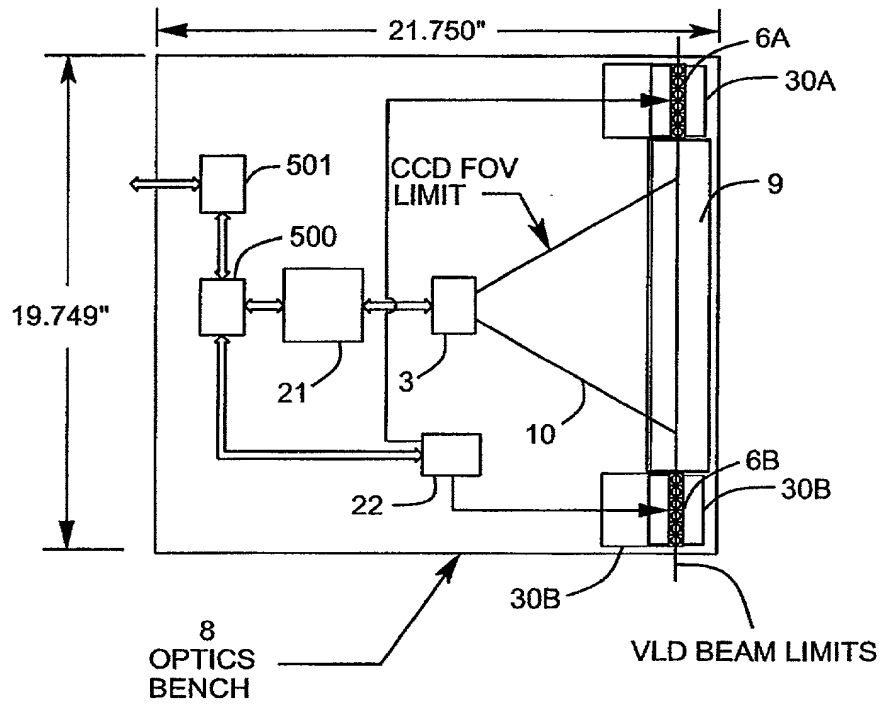


FIG. 1G2

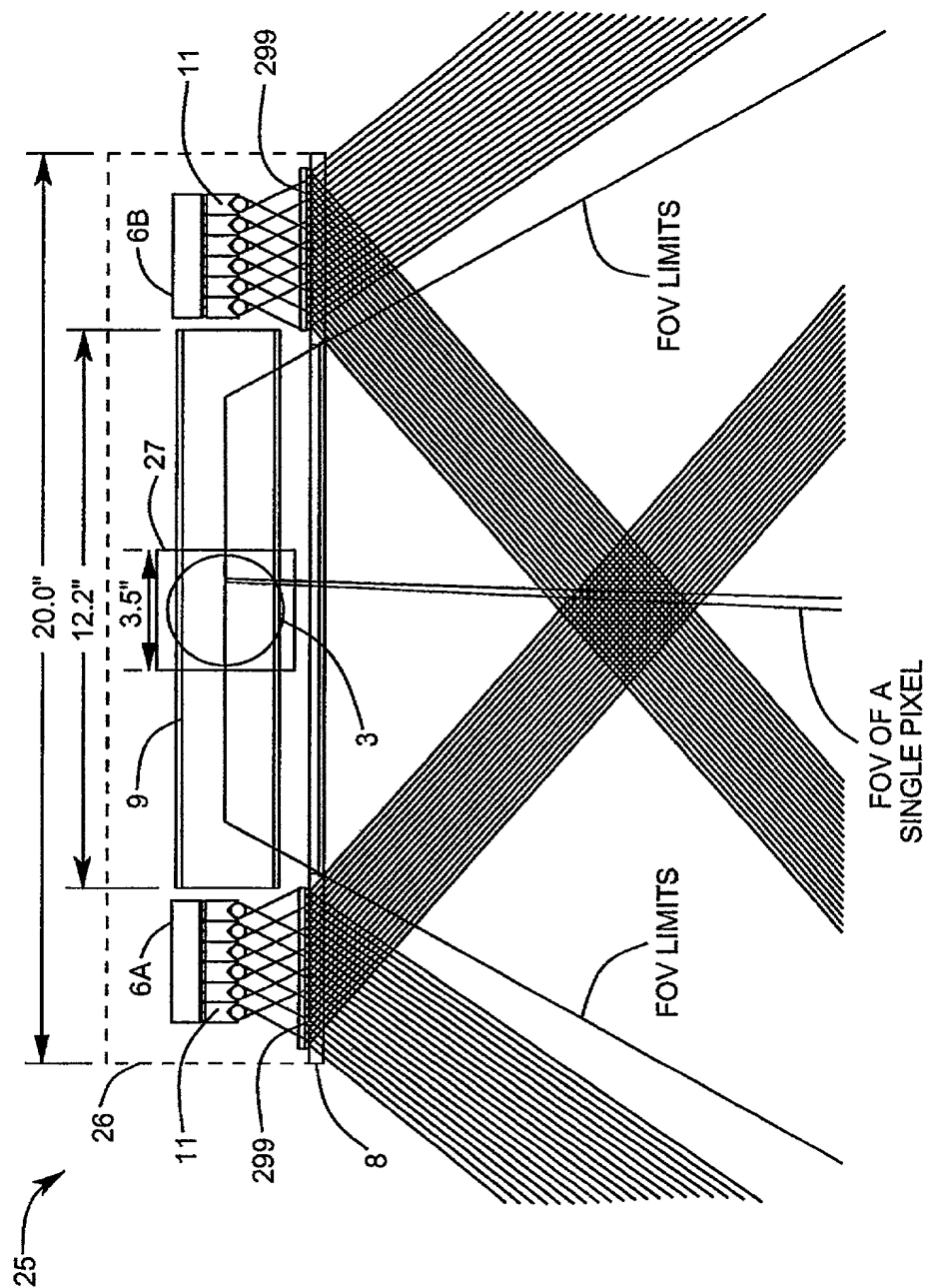


FIG. 1G3

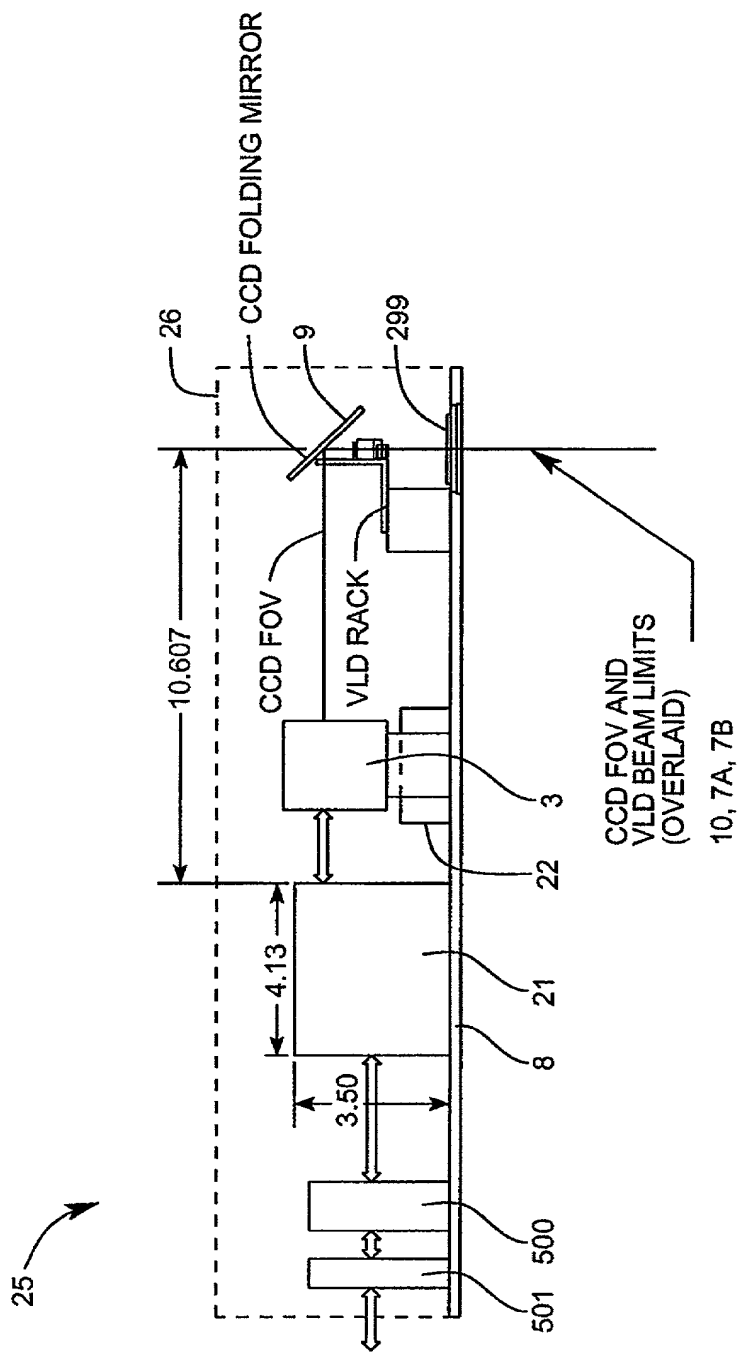


FIG. 1G4

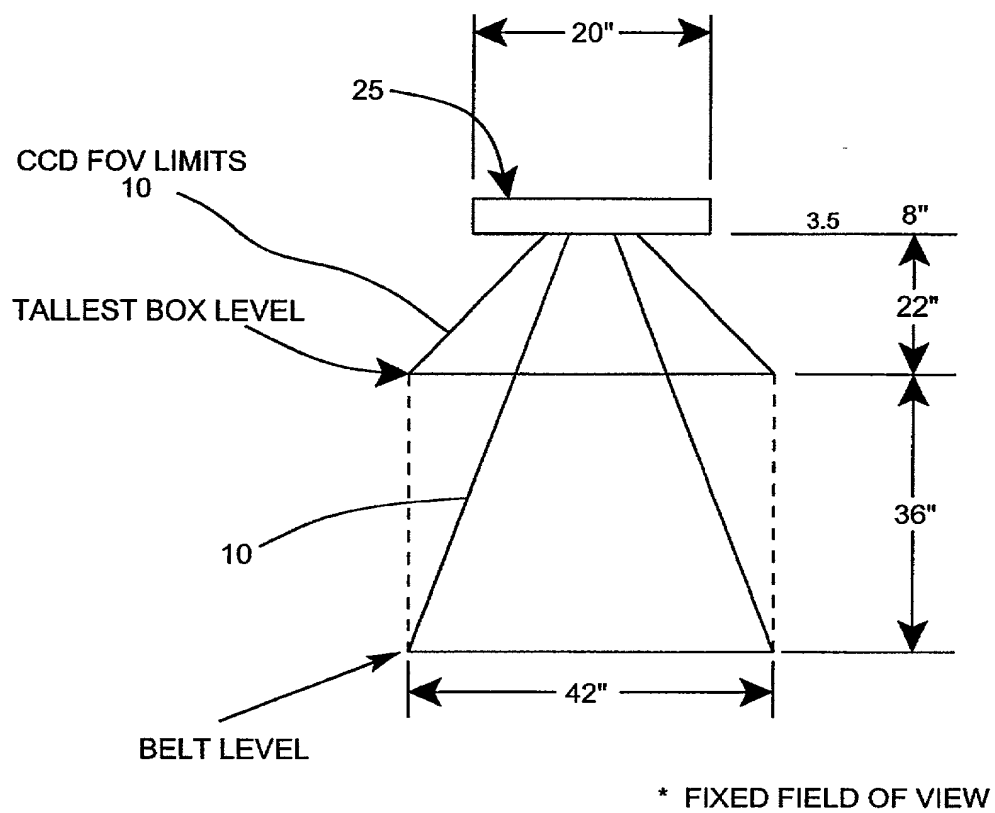


FIG. 1G5

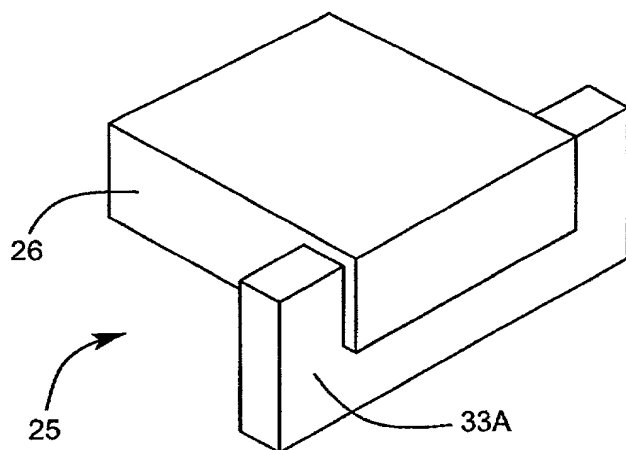


FIG. 1G6

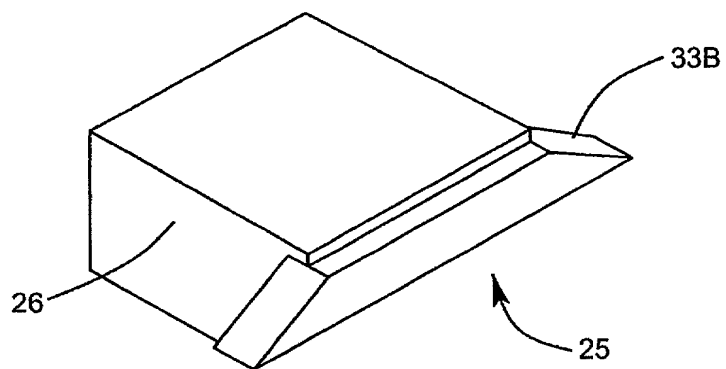


FIG. 1G7



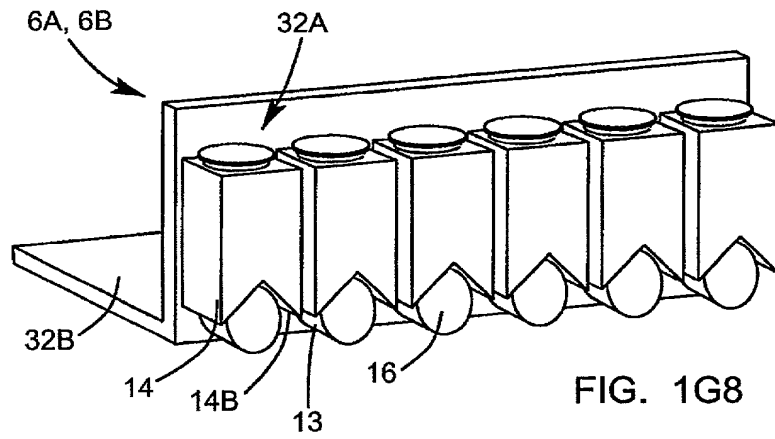


FIG. 1G8

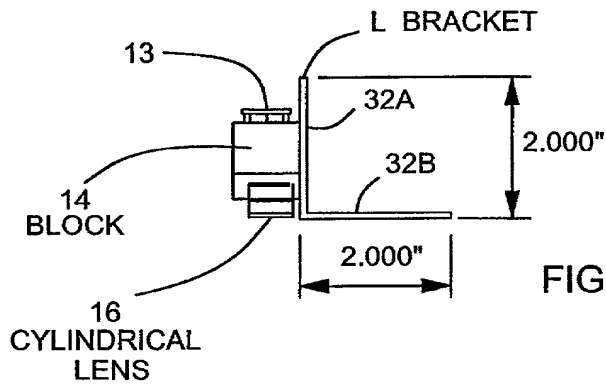


FIG. 1G9

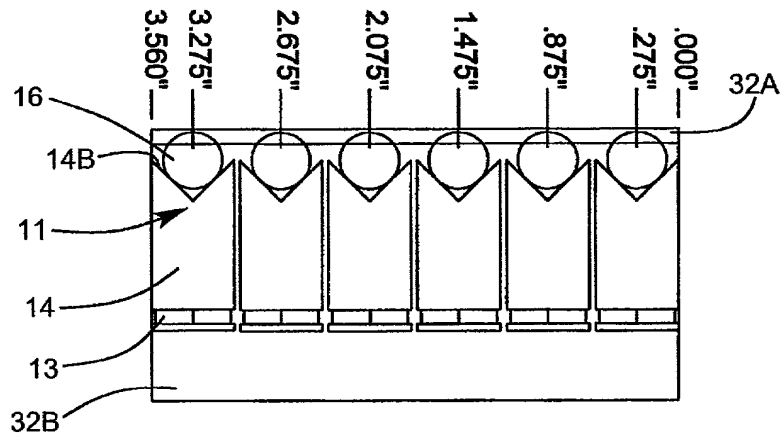


FIG. 1G10

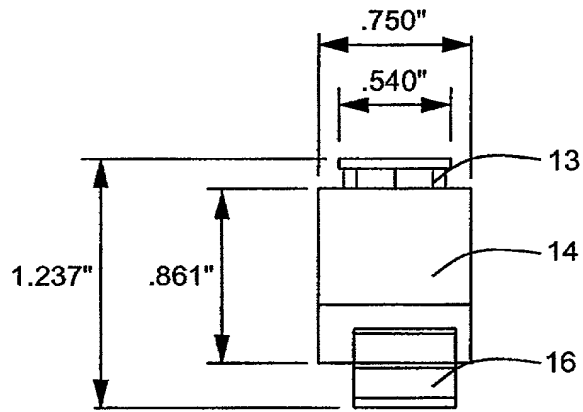


FIG. 1G11

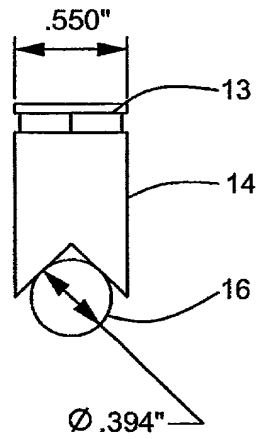


FIG. 1G12

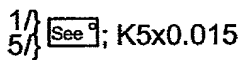
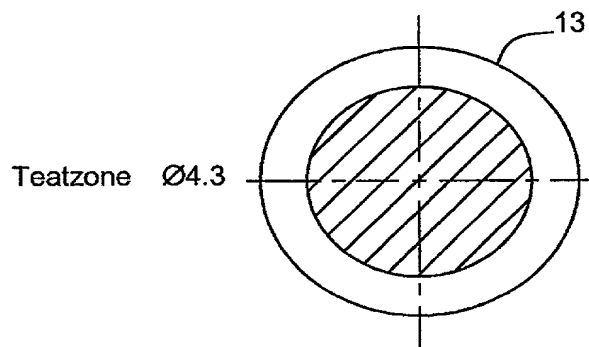
[illegible]

FIG. 1G14



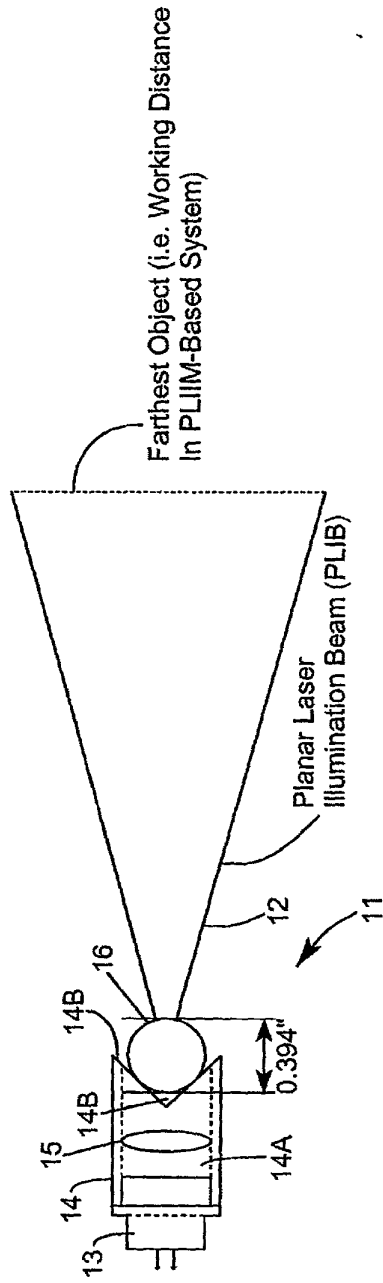


FIG. 1G15A

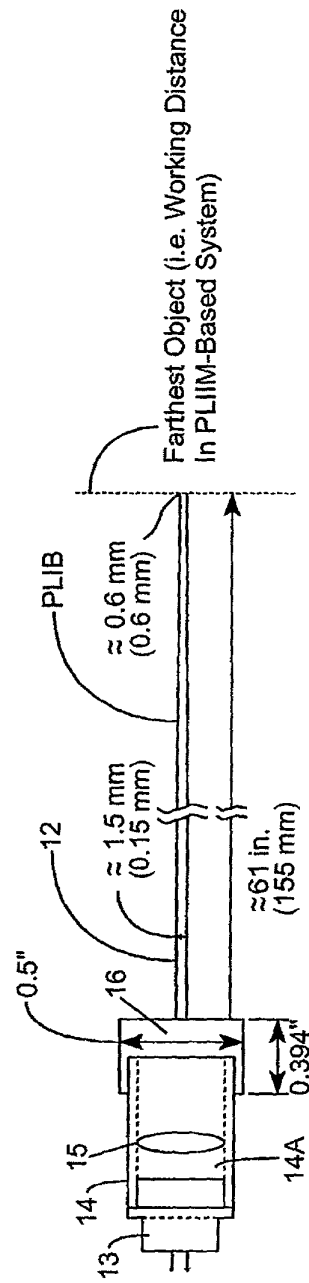


FIG. 1G15B

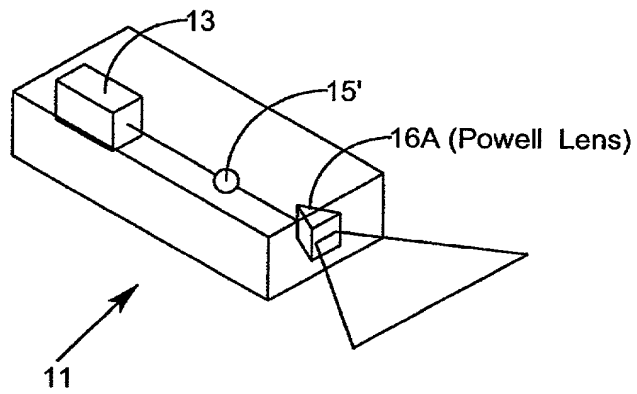


FIG. 1G16A

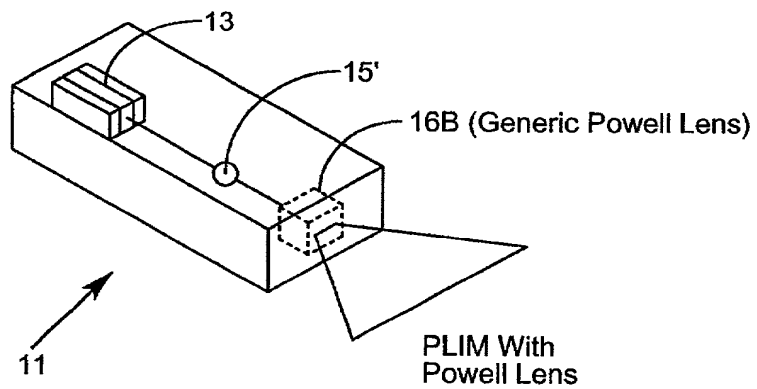


FIG. 1G16B

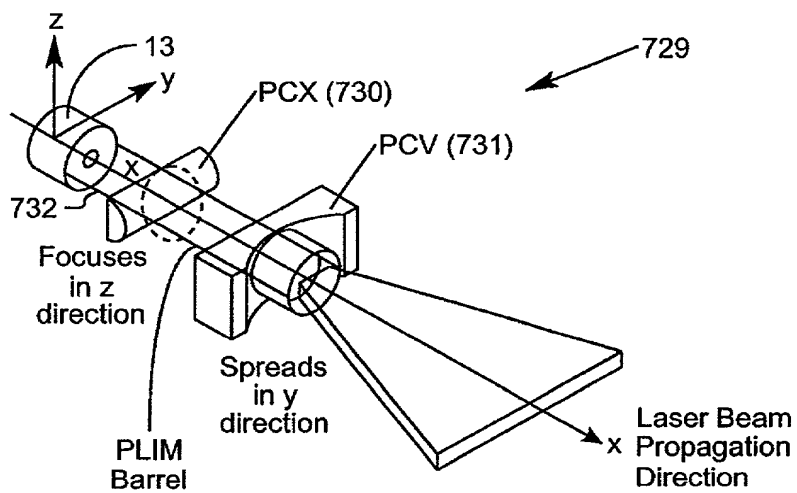


FIG. 1G17A

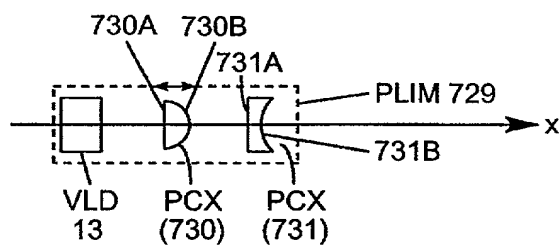


FIG. 1G17B

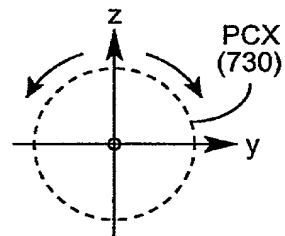


FIG. 1G17C

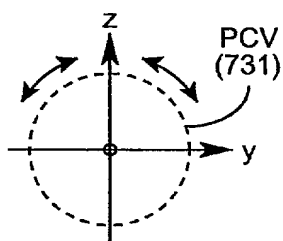


FIG. 1G17D

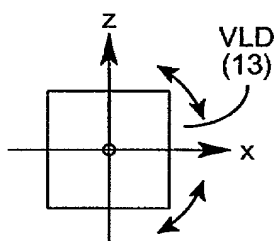


FIG. 1G17E

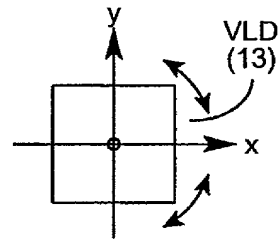


FIG. 1G17F

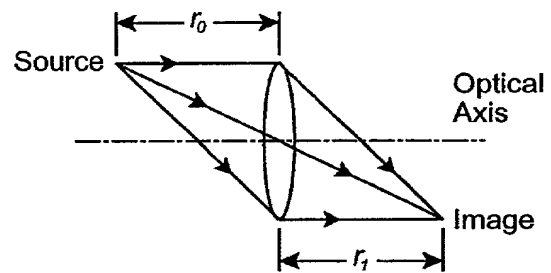


FIG. 1H1

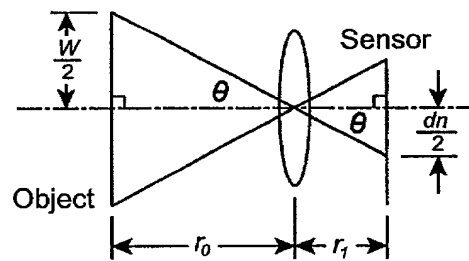


FIG. 1H2

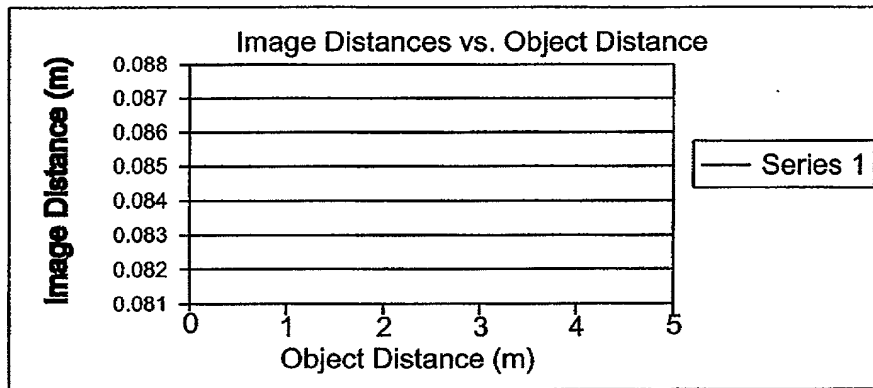


FIG. 1H3

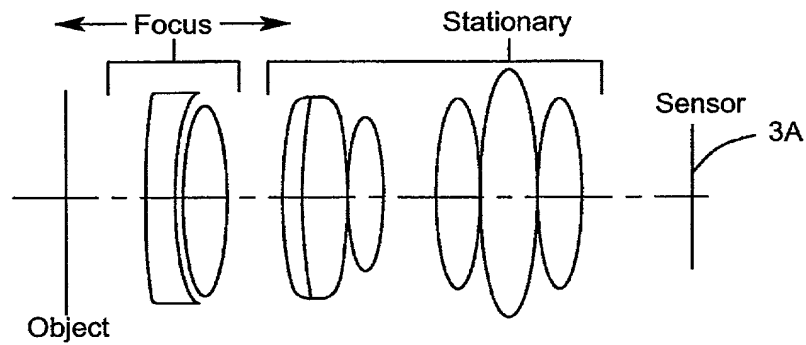


FIG. 1H4

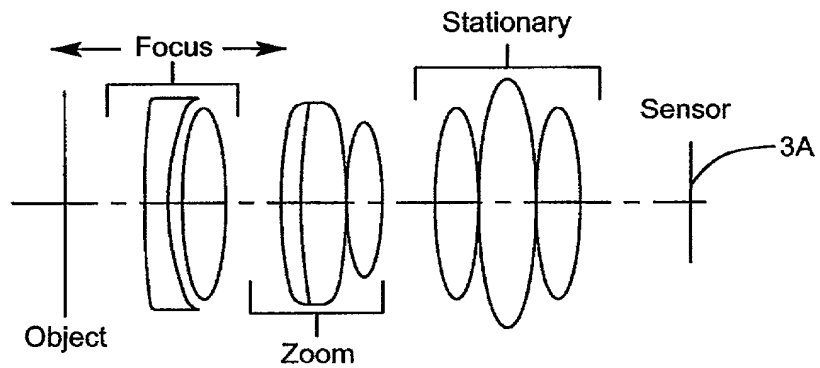


FIG. 1H5



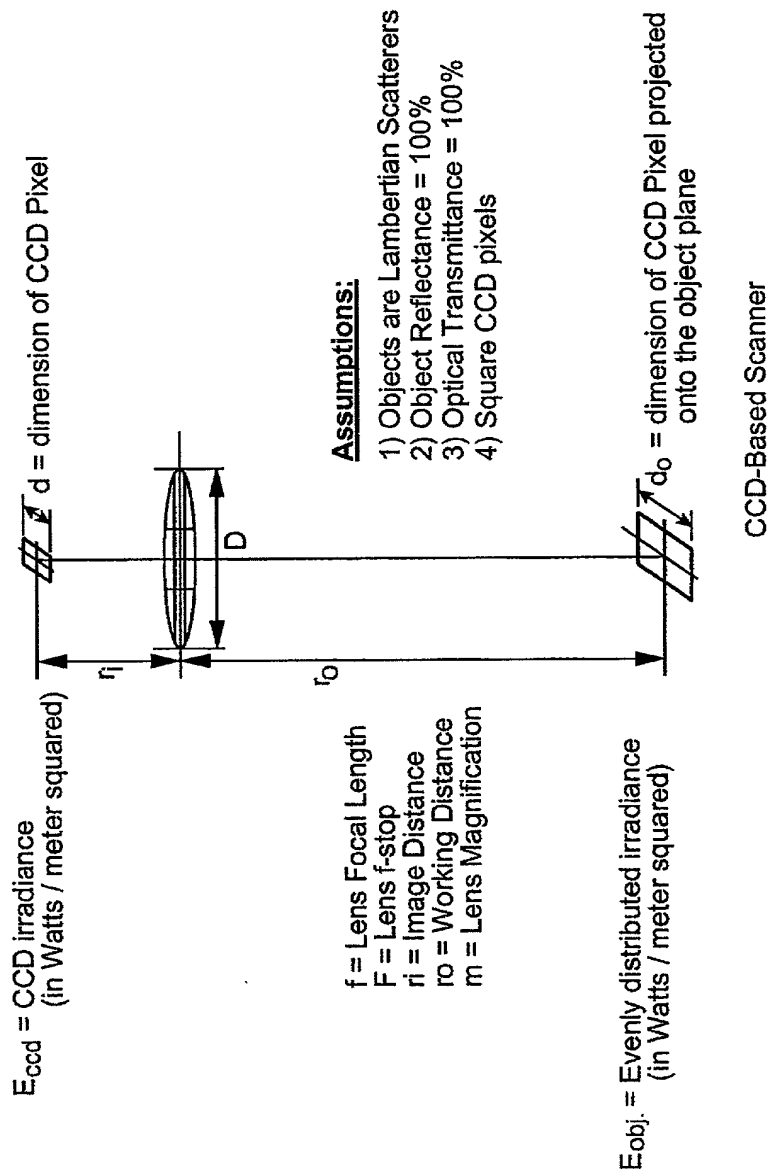


FIG. 1H6

FIRST GENERALIZED METHOD OF REDUCING  
SPECKLE-NOISE PATTERNS AT IMAGE DETECTION  
ARRAY OF THE IFD SUBSYSTEM (3)

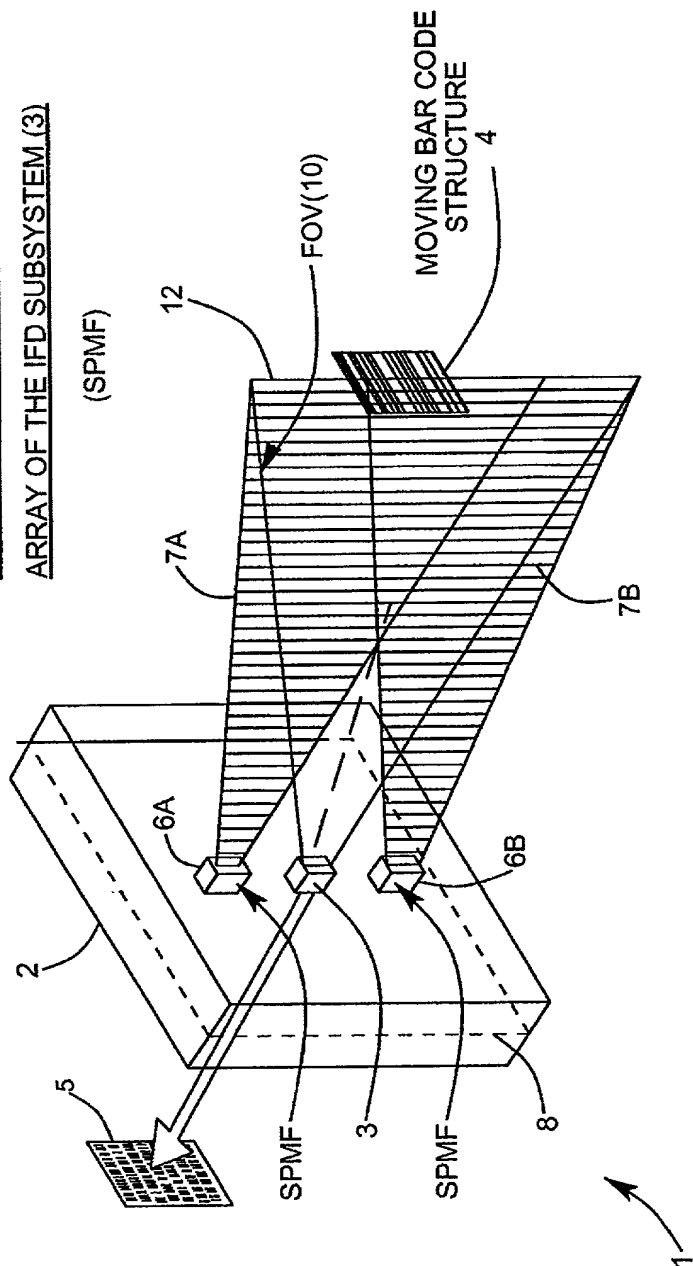


FIG. 111



THE FIRST GENERALIZED SPECKLE-NOISE PATTERN REDUCTION  
METHOD OF THE PRESENT INVENTION

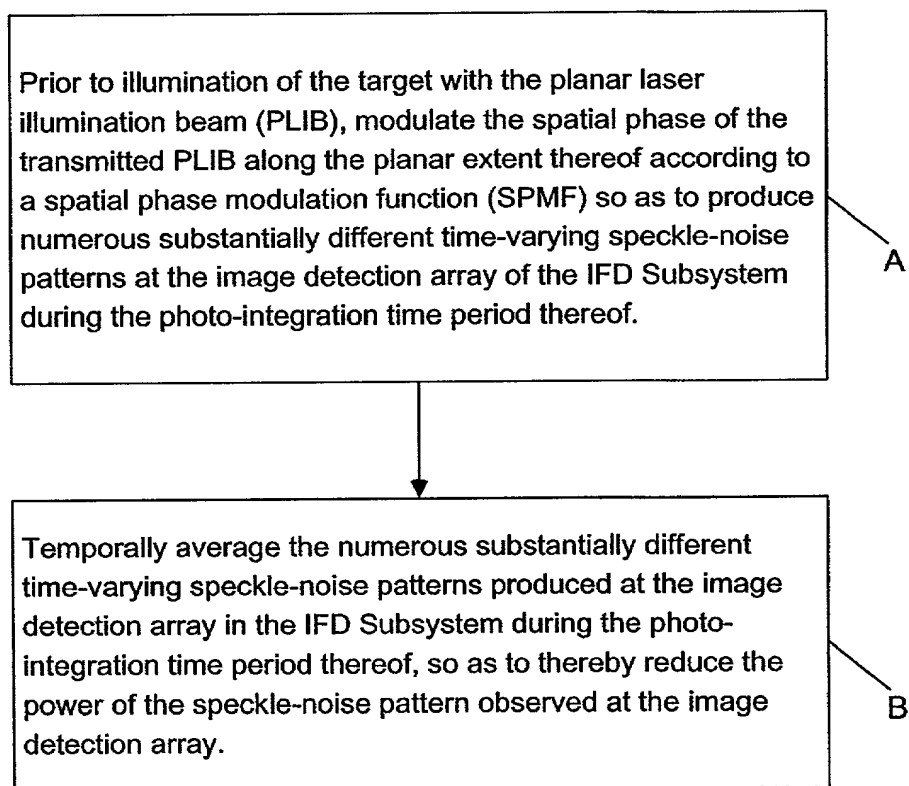
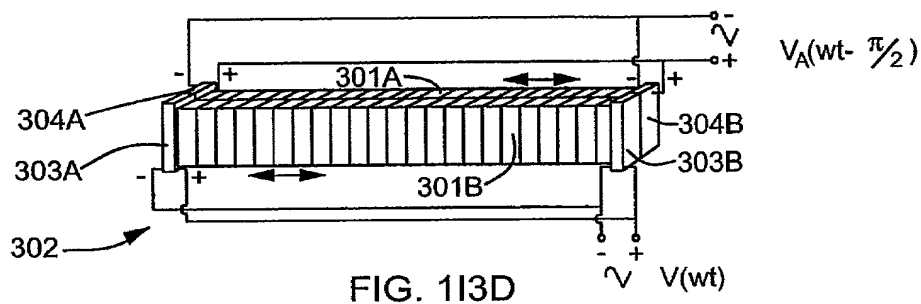
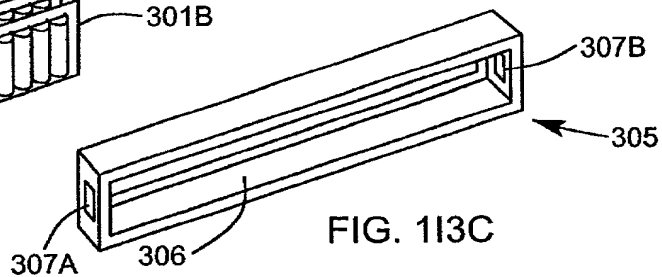
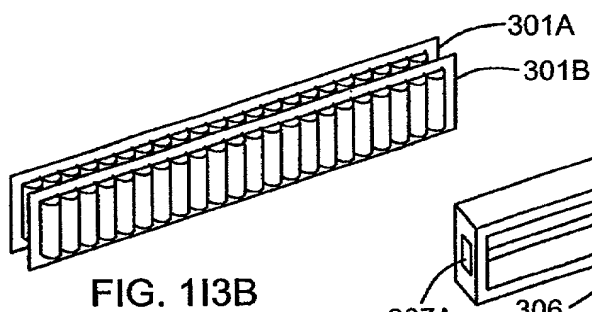
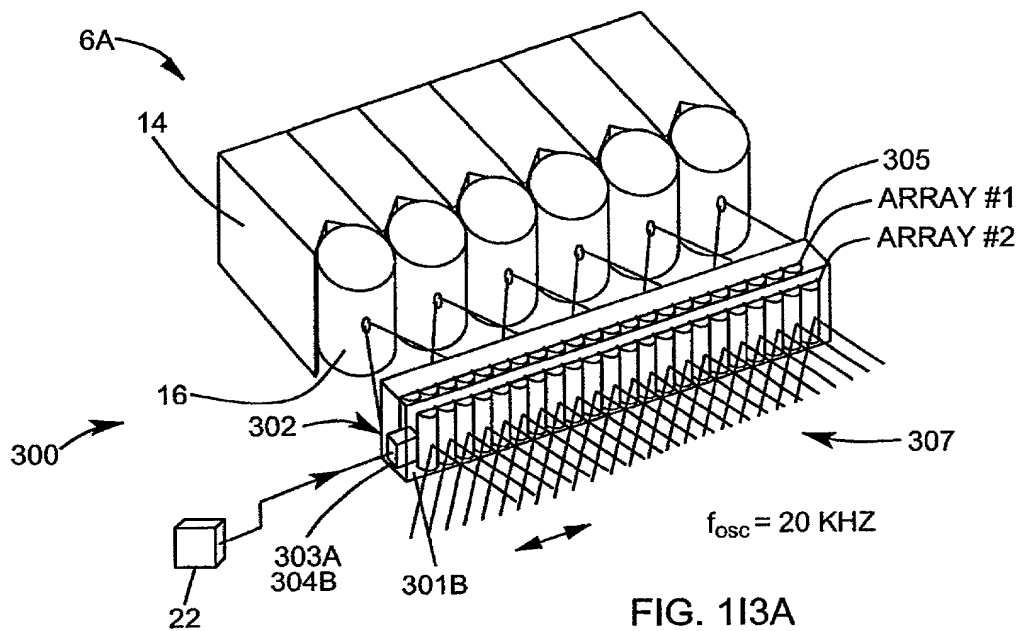


FIG. 112B



TARGET OBJECT

PORTION OF THE CYLINDRICAL LENS ARRAY

$D$

$P$

$\Delta x$

$(\Delta x/D)P = \lambda$

CYLINDER LENS

LASER  $\sim \lambda$

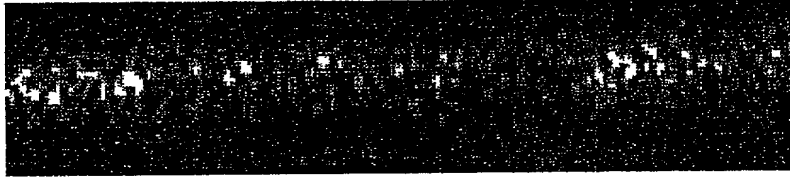


FIG. 113F

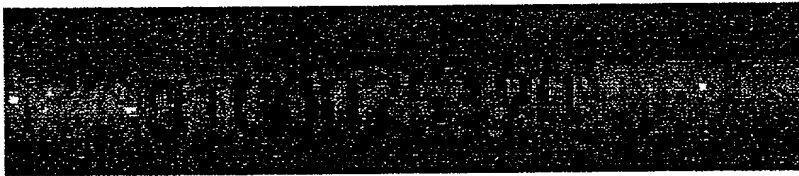
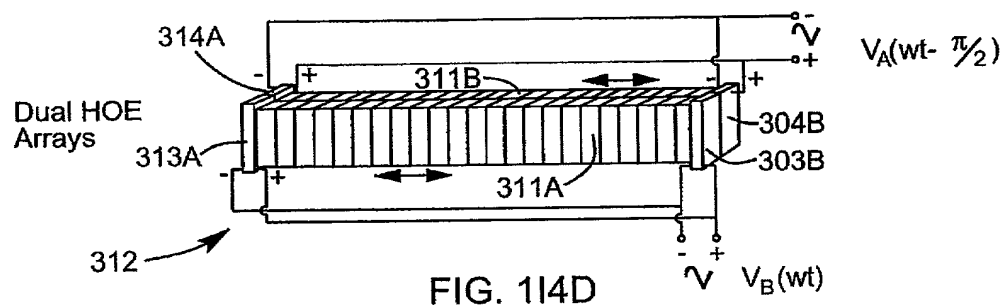
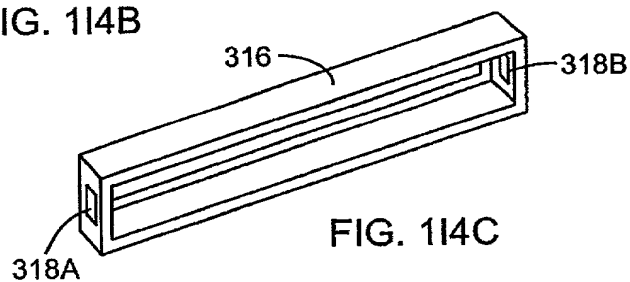
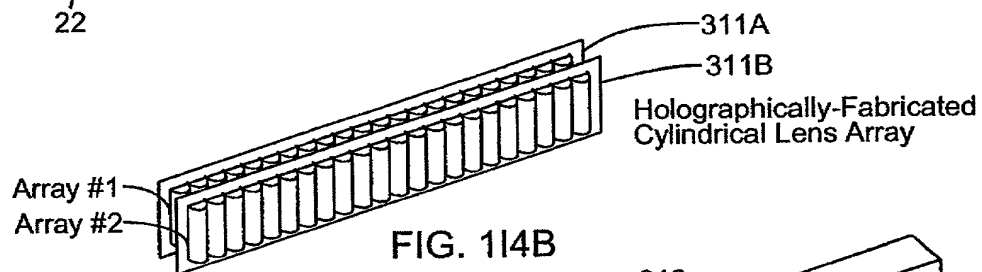
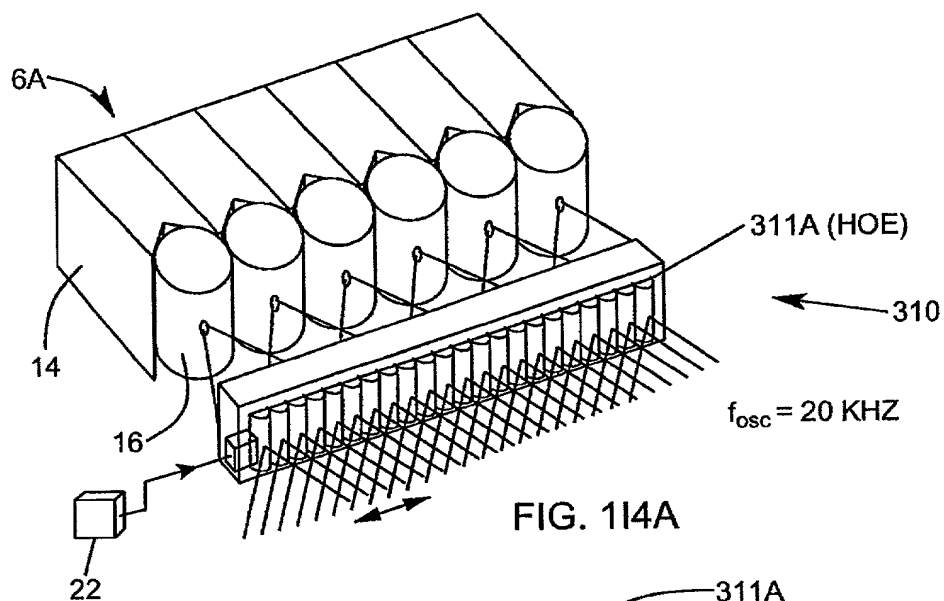
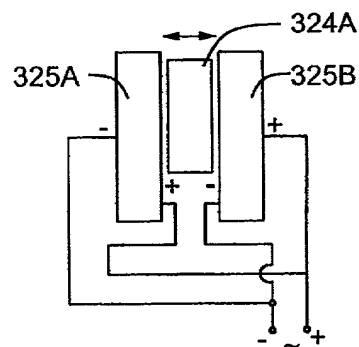
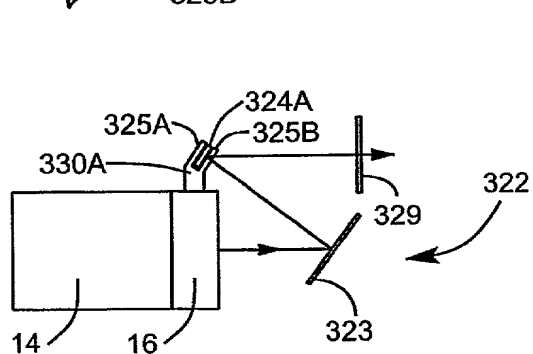
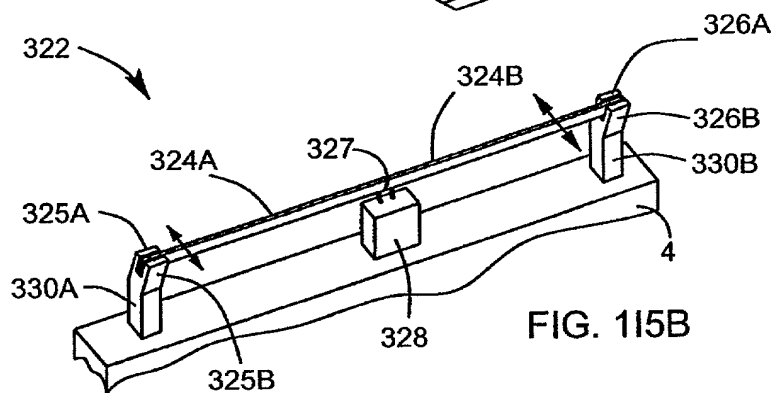
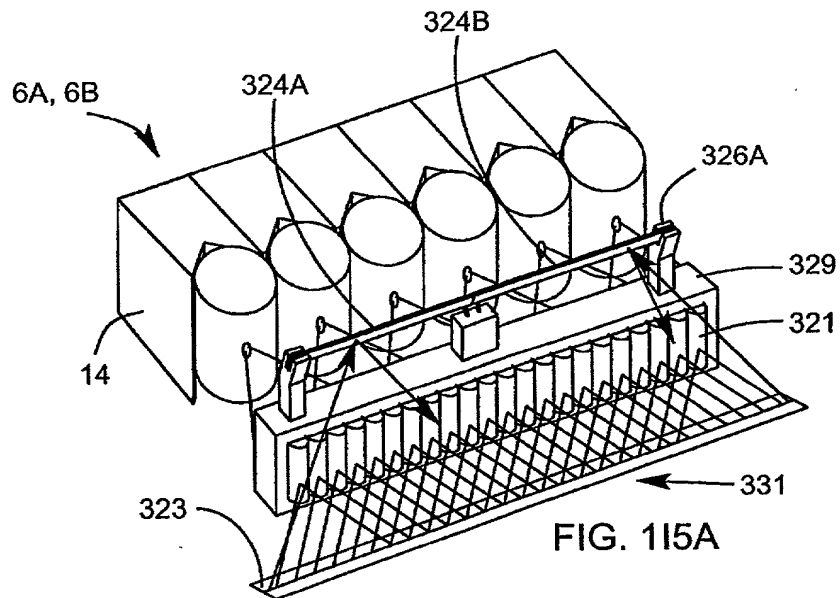


FIG. 113G

2000-01-01 09:52:50







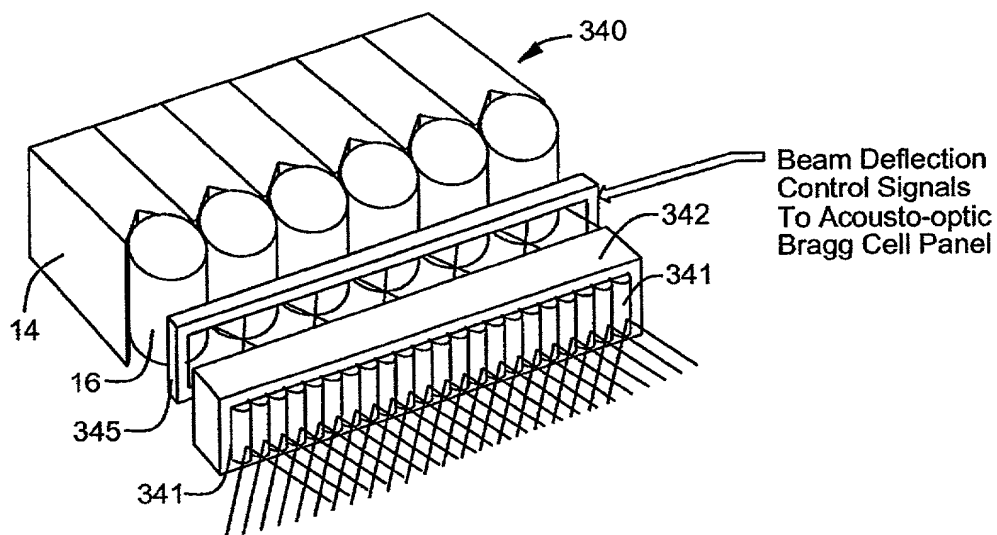


FIG. 116A

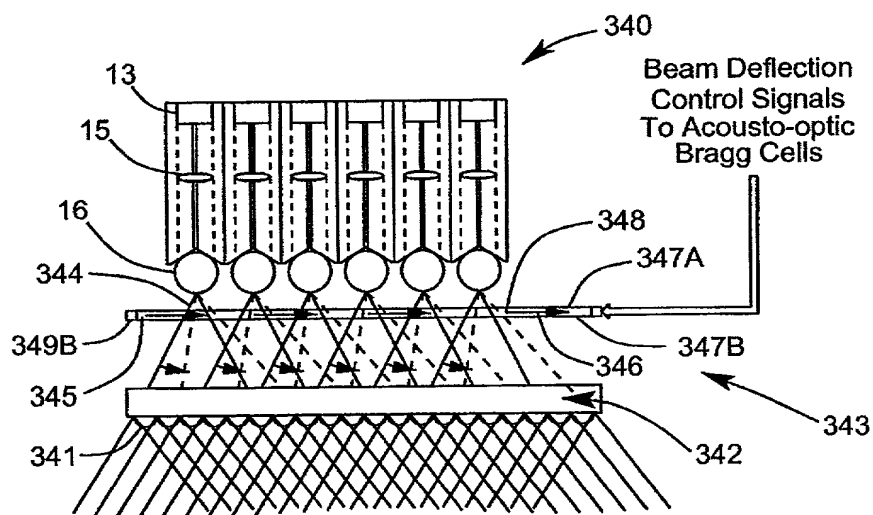
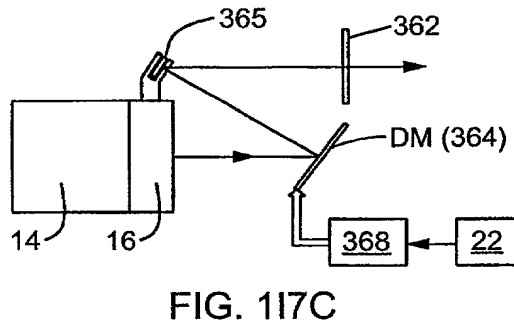
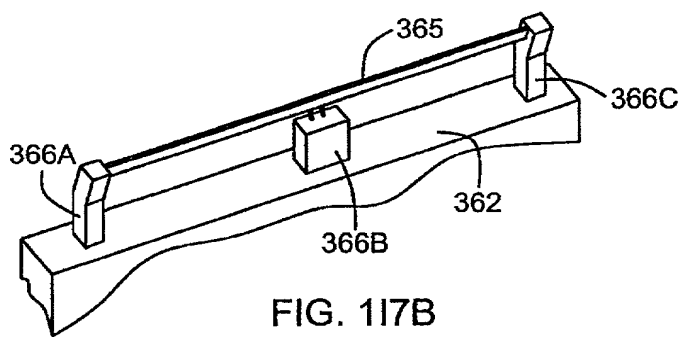
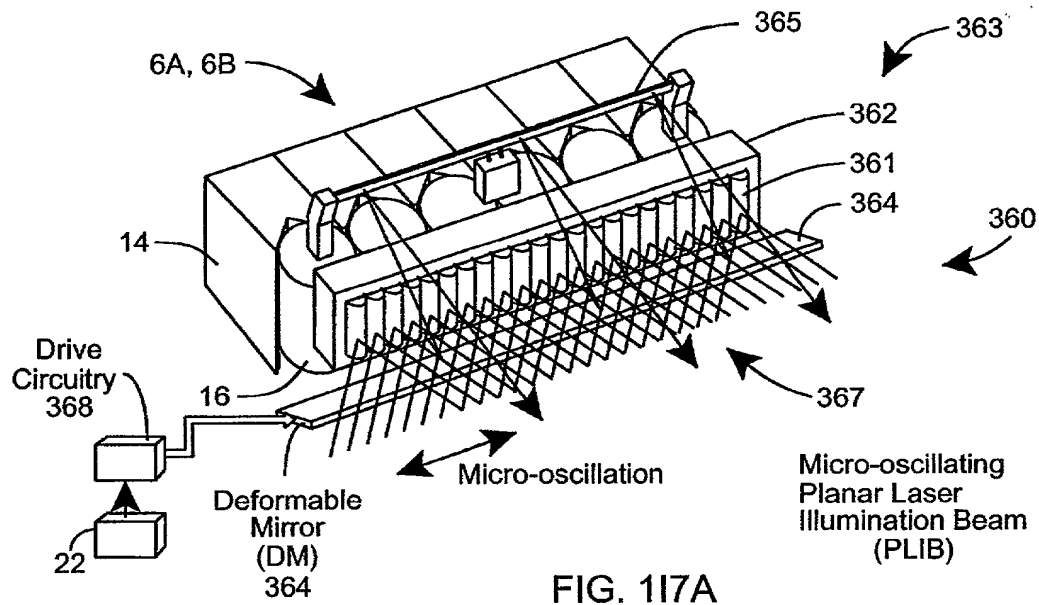


FIG. 116B



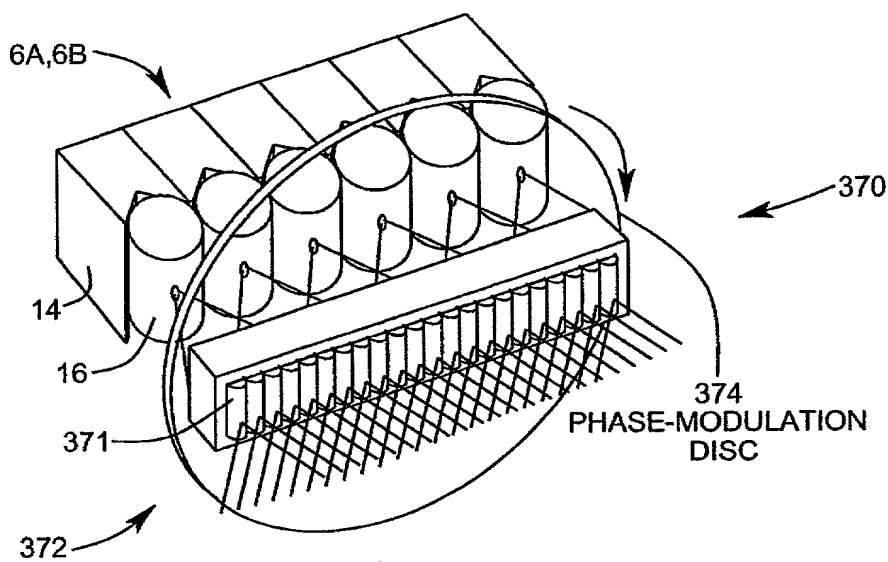


FIG. 118A

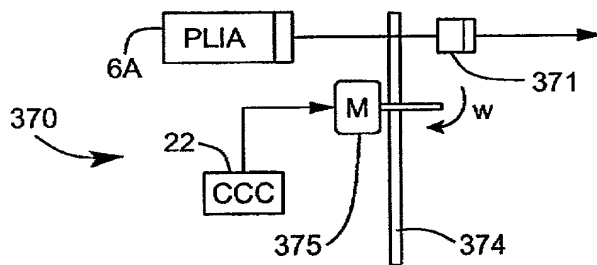


FIG. 118B

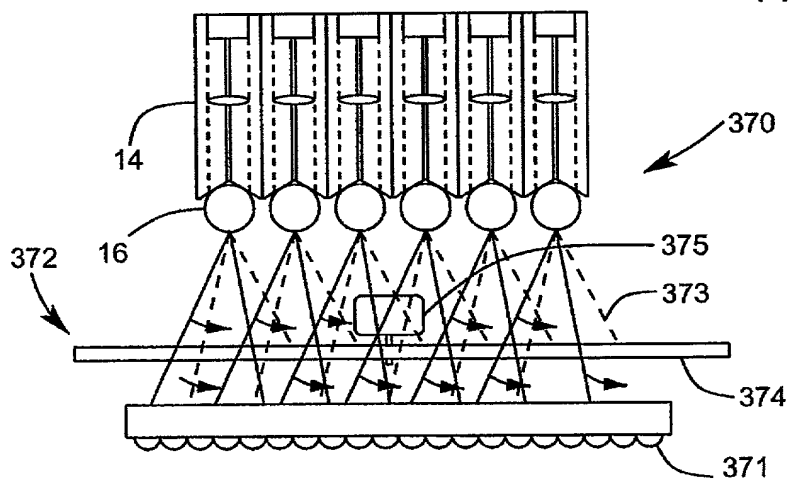


FIG. 118C

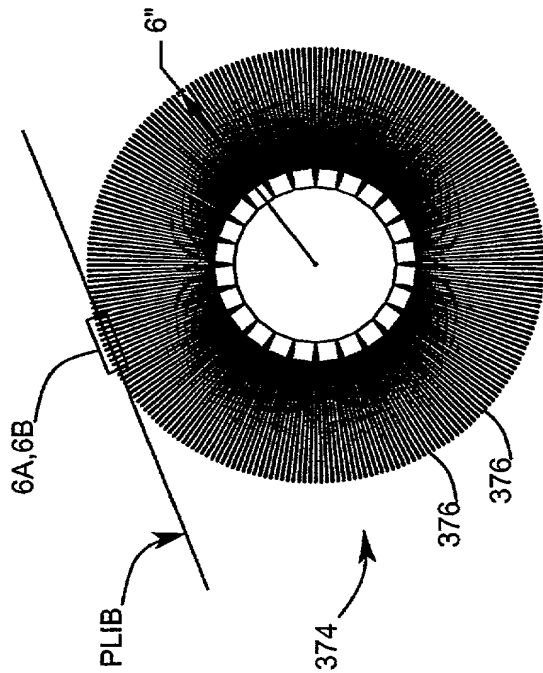


FIG. 118D

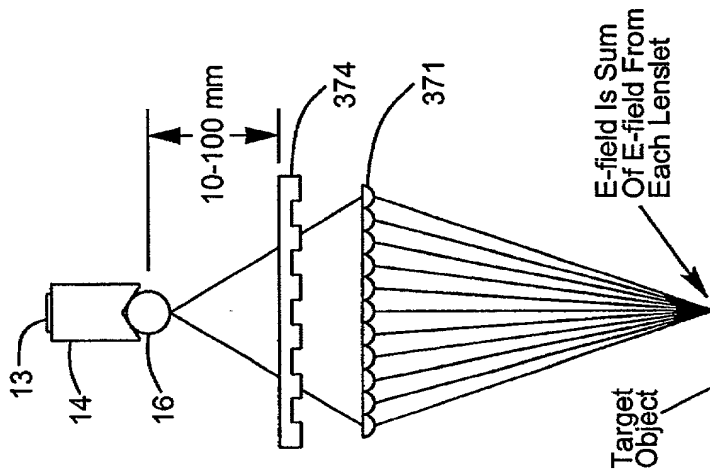


FIG. 118E

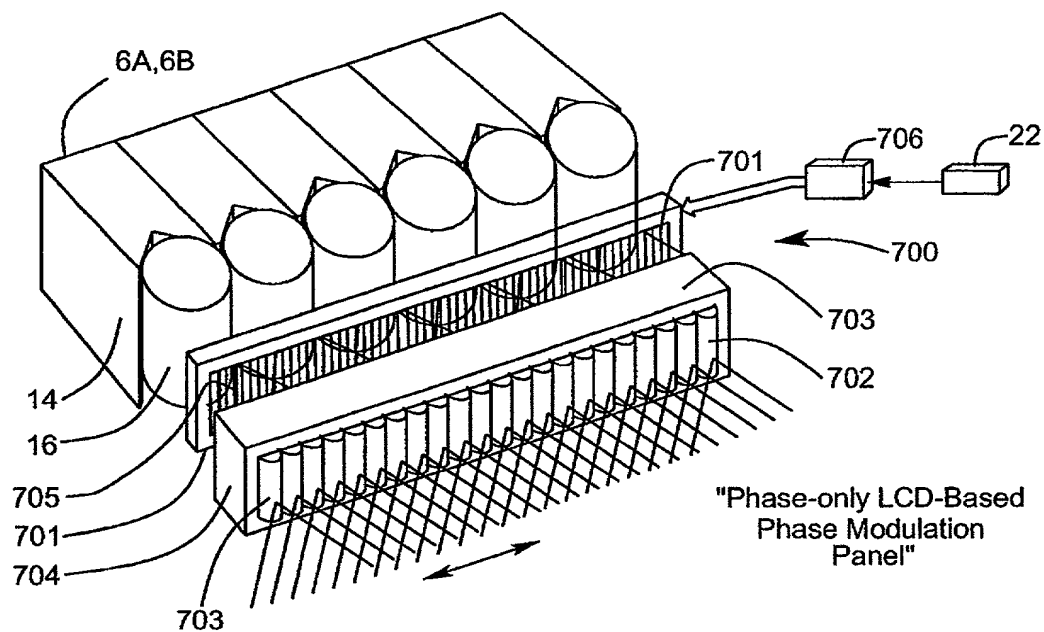


FIG. 118F

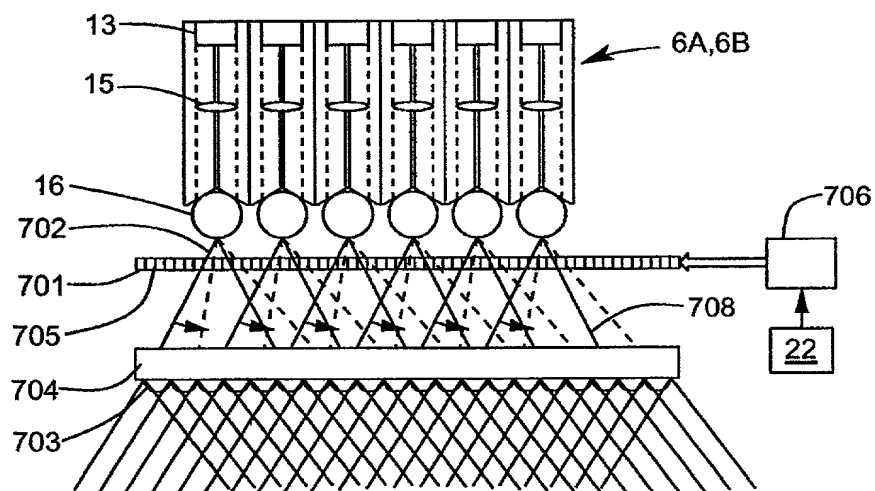


FIG. 118G

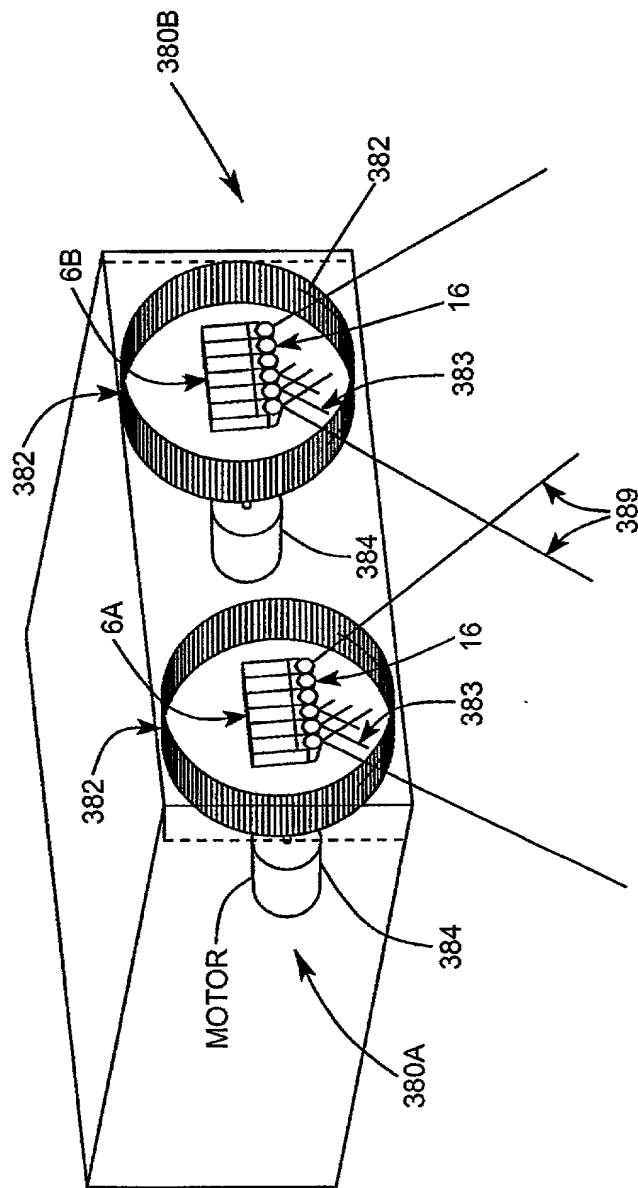


FIG. 119A

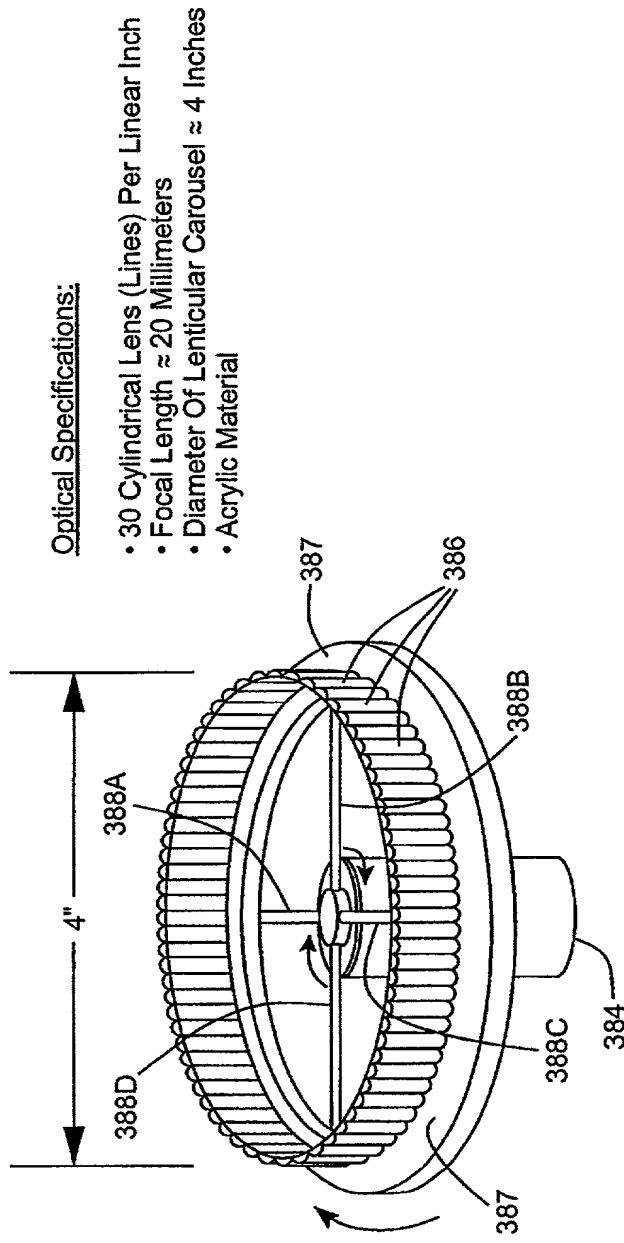


FIG. 119B



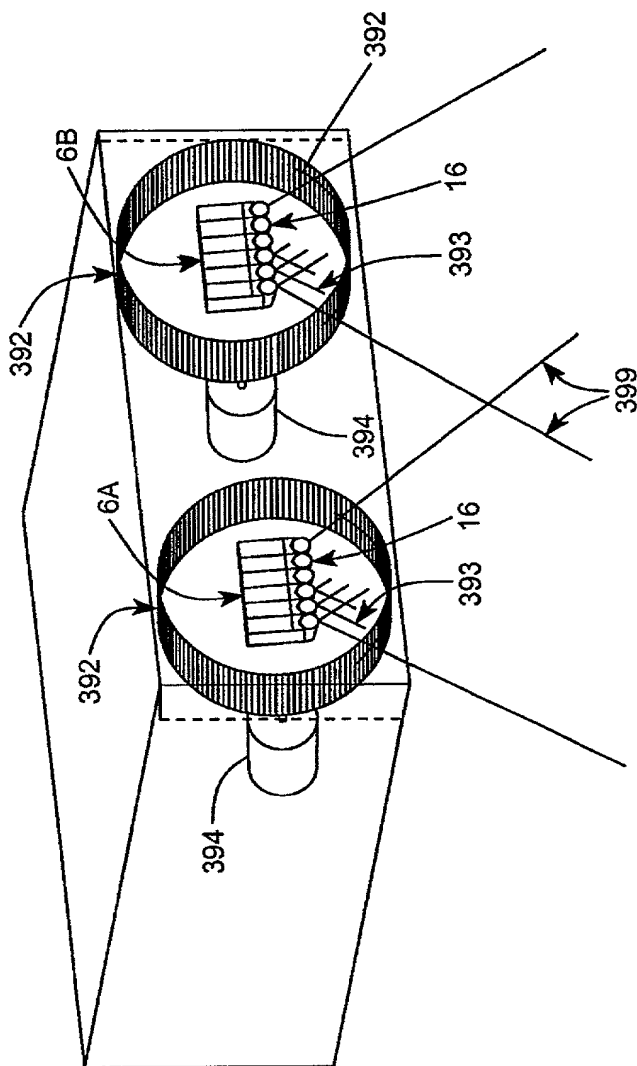


FIG. 1110A

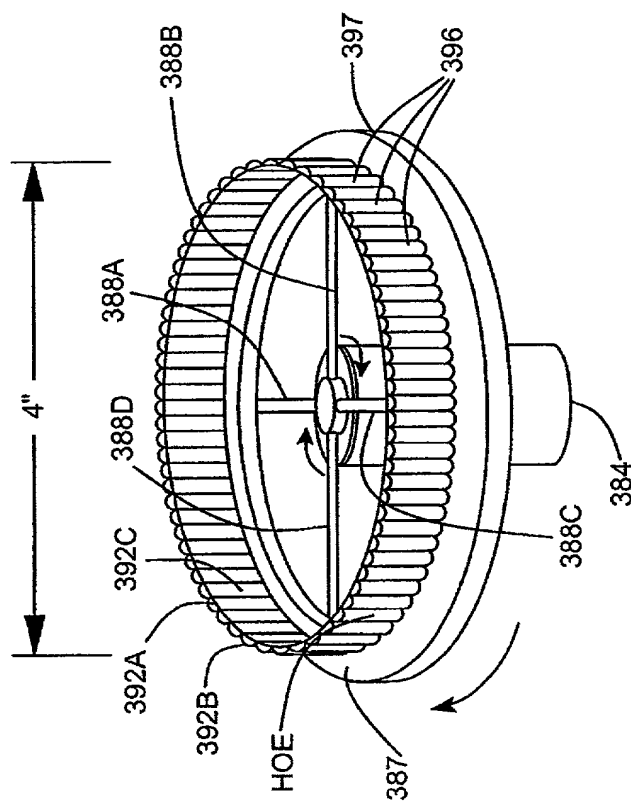


FIG. 1110B

**Optical Specifications:**

- 30 Cylindrical Lens (Lines) Per Linear Inch
- Focal Length  $\approx 20$  Millimeters
- Diameter Of Lenticular Carousel  $\approx 4$  Inches



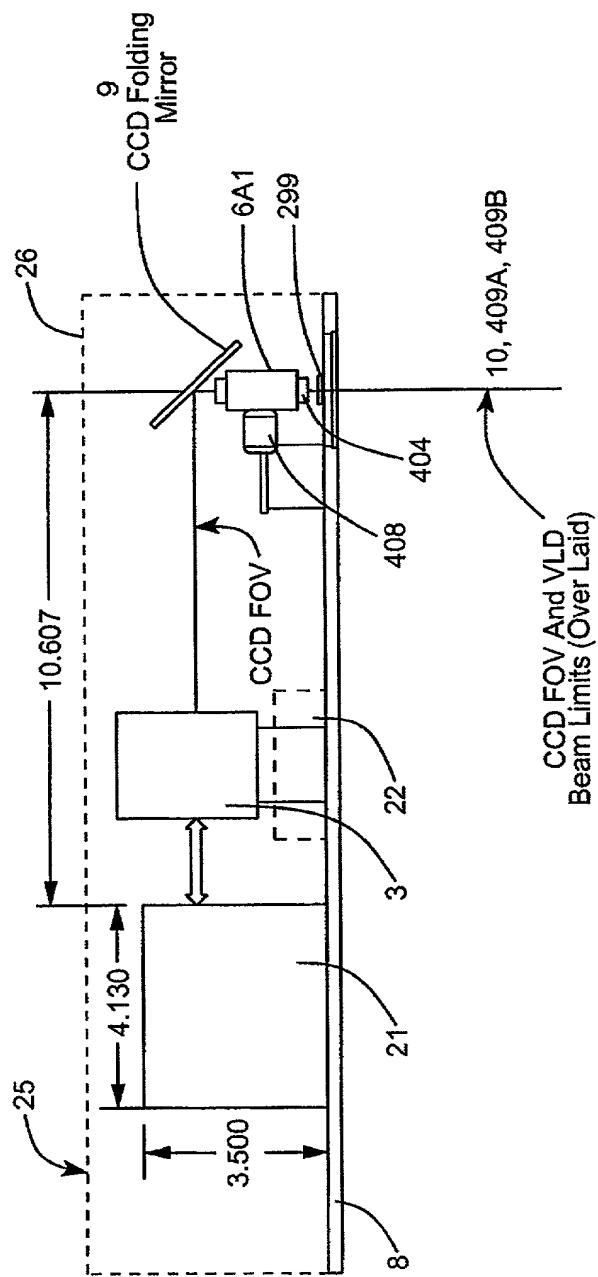


FIG. 1111B

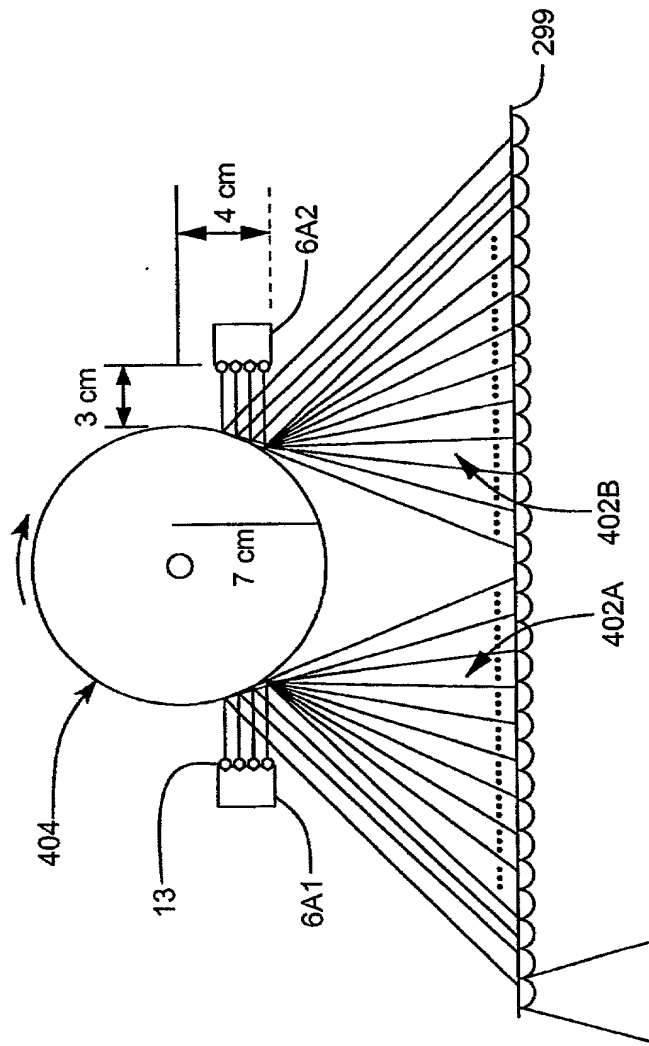


FIG. 1111C

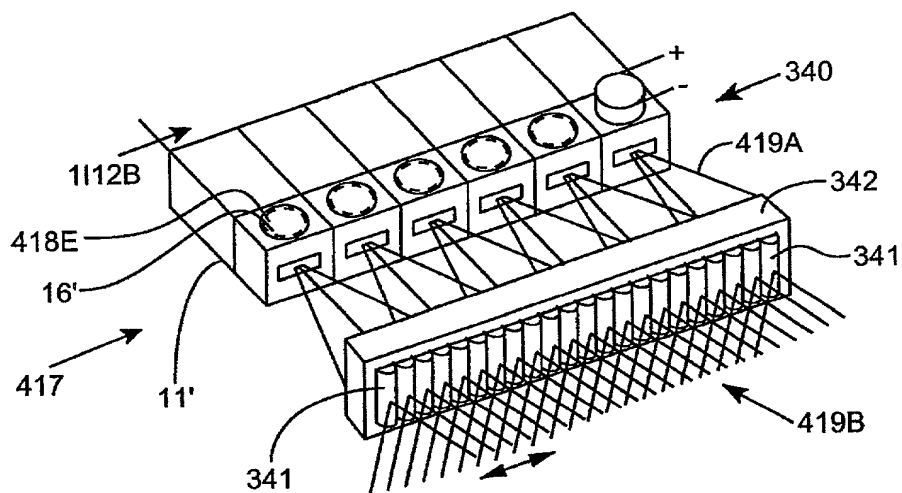


FIG. 1112A

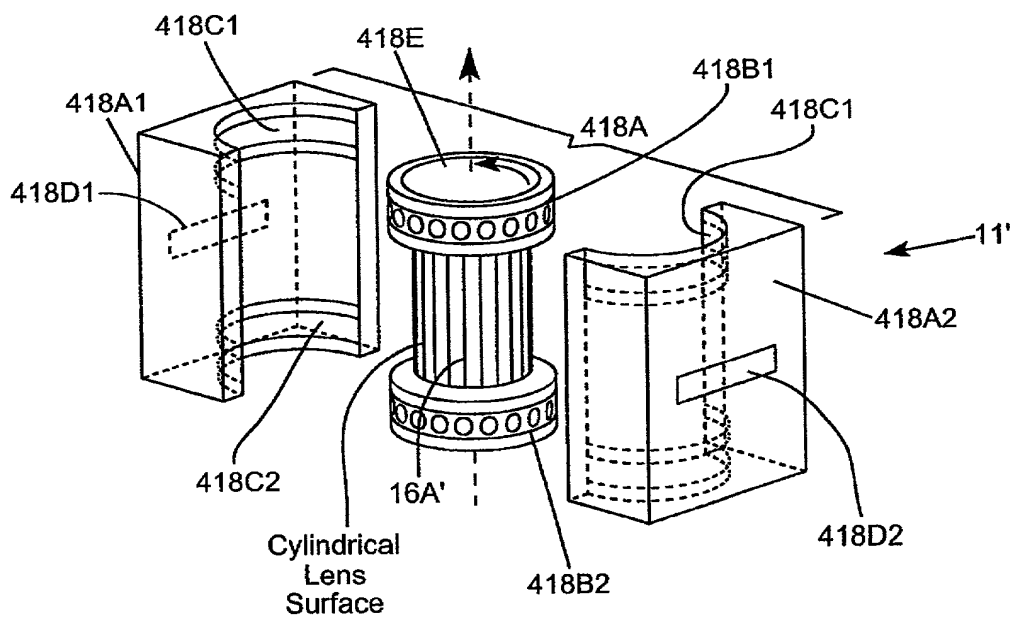


FIG. 1112B

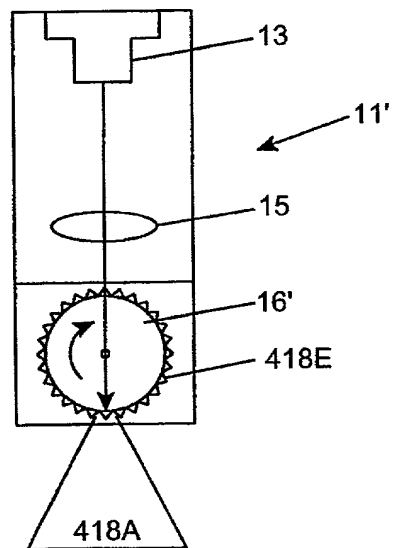


FIG. 1112C

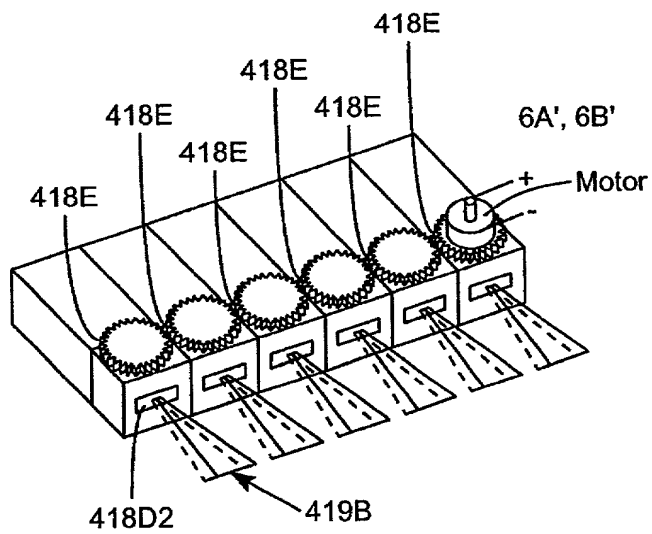


FIG. 1112D

Second Generalized Method Of  
Reducing Speckle-Noise Patterns  
At Image Detection Array  
Of The IFD Subsystem (3)

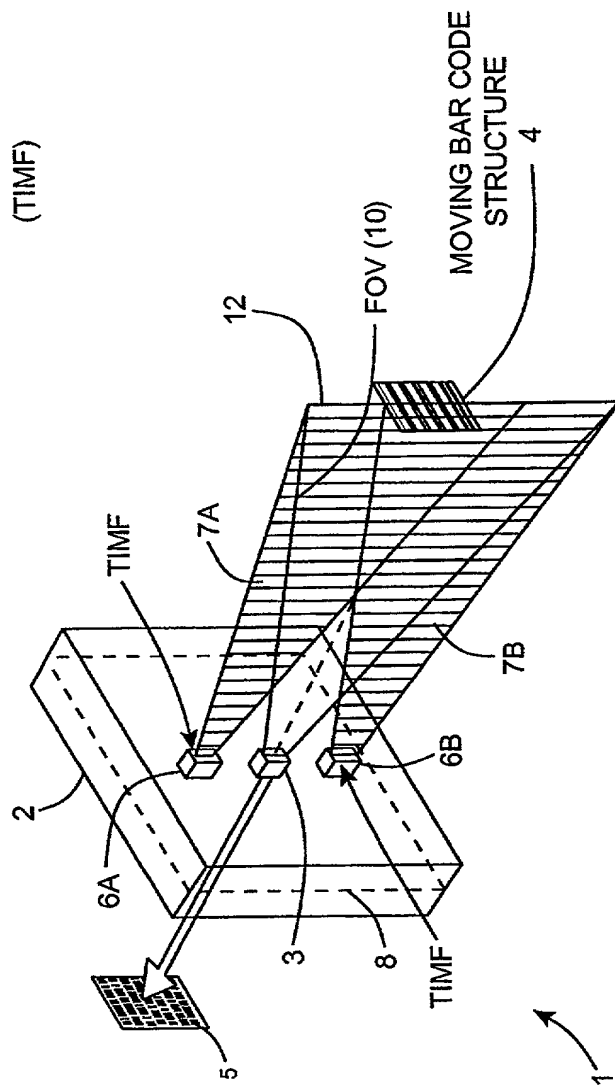


FIG. 1113





THE SECOND GENERALIZED SPECKLE-NOISE PATTERN REDUCTION  
METHOD OF THE PRESENT INVENTION

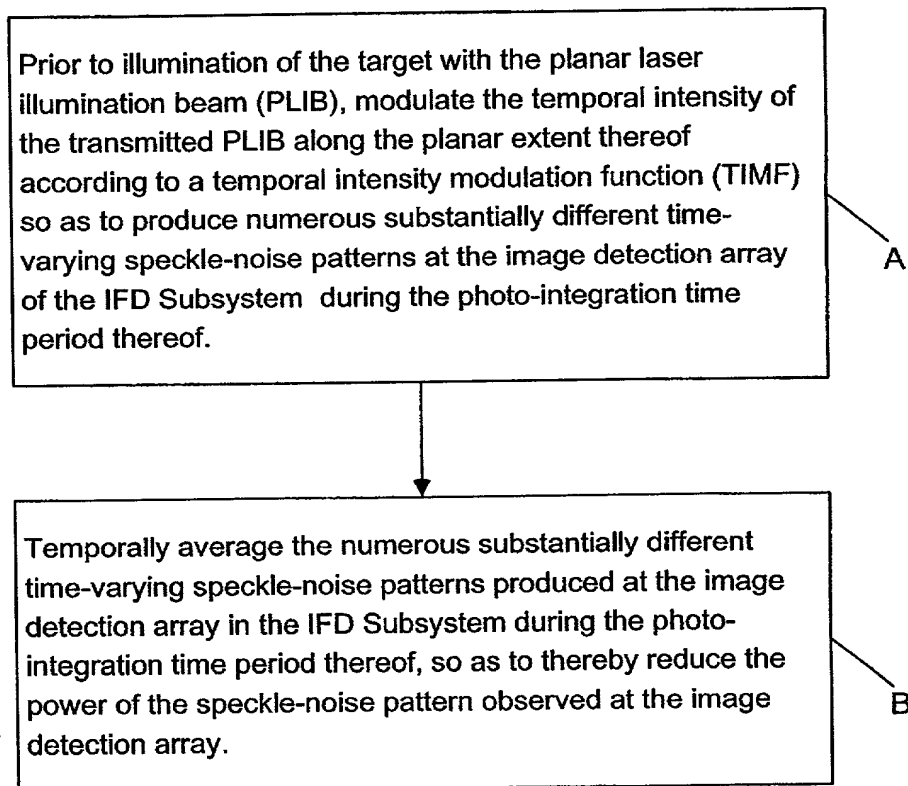


FIG. 1113B

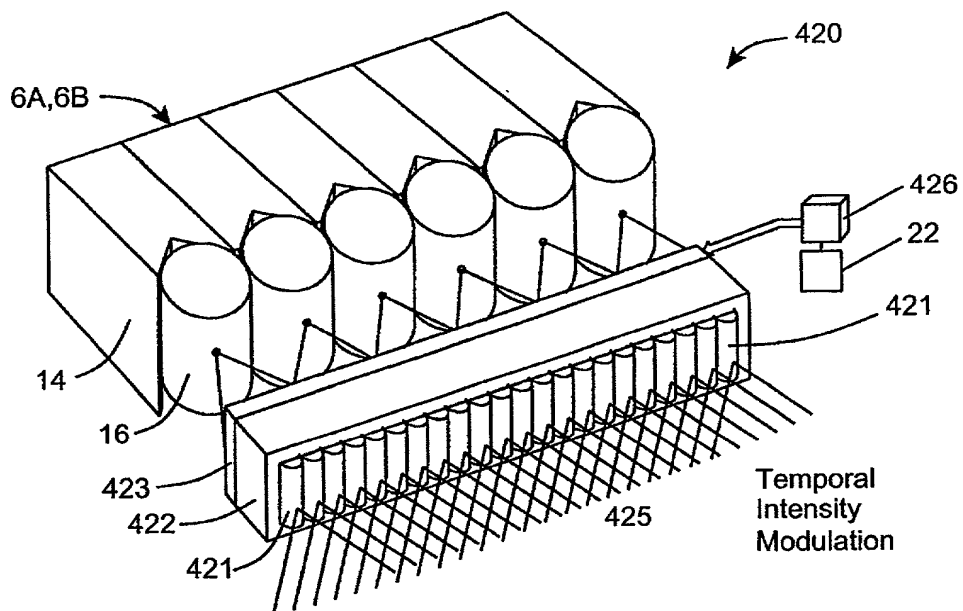


FIG. 1114A

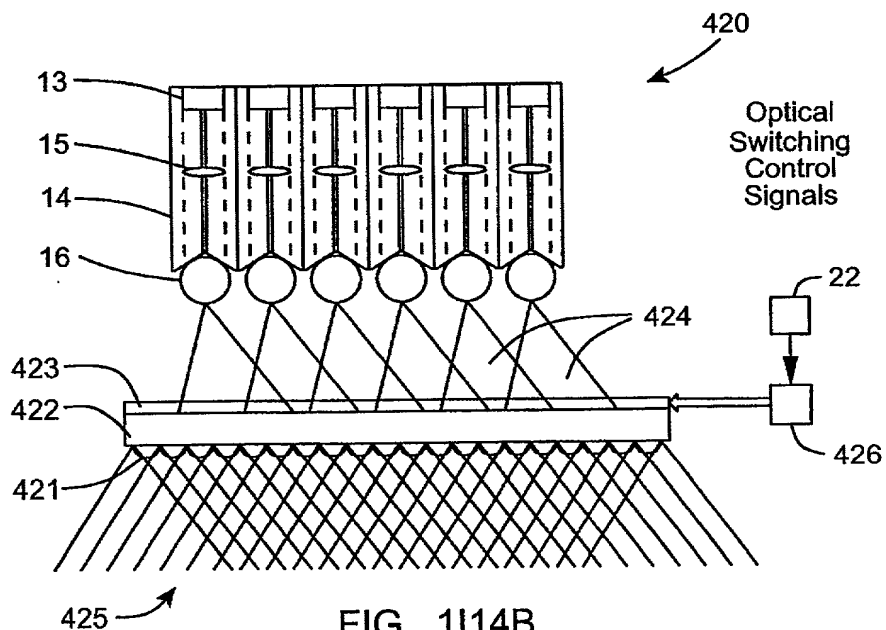


FIG. 1114B

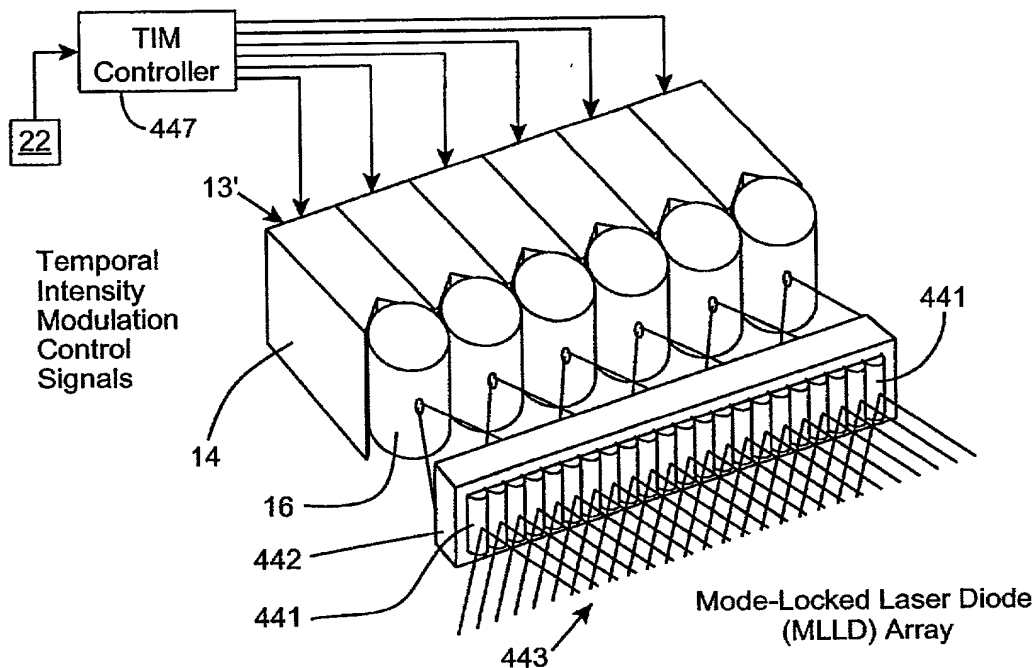


FIG. 1115A

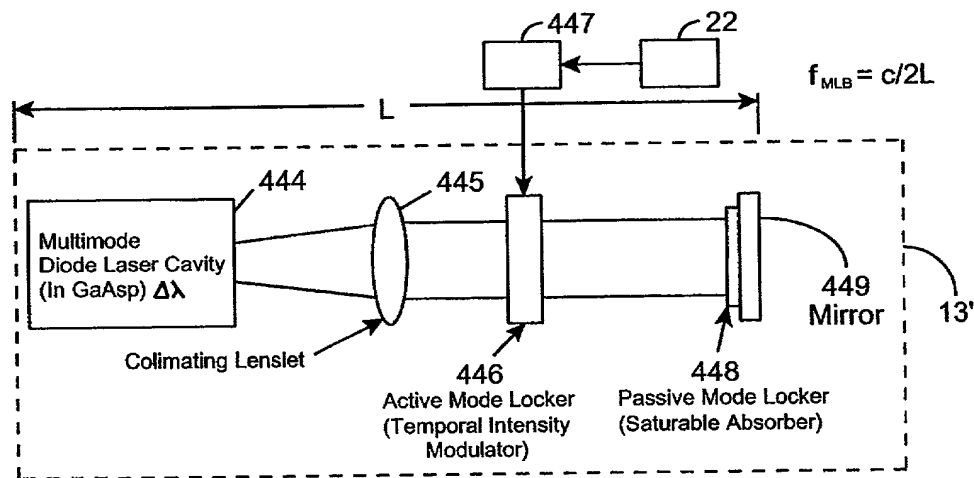


FIG. 1115B

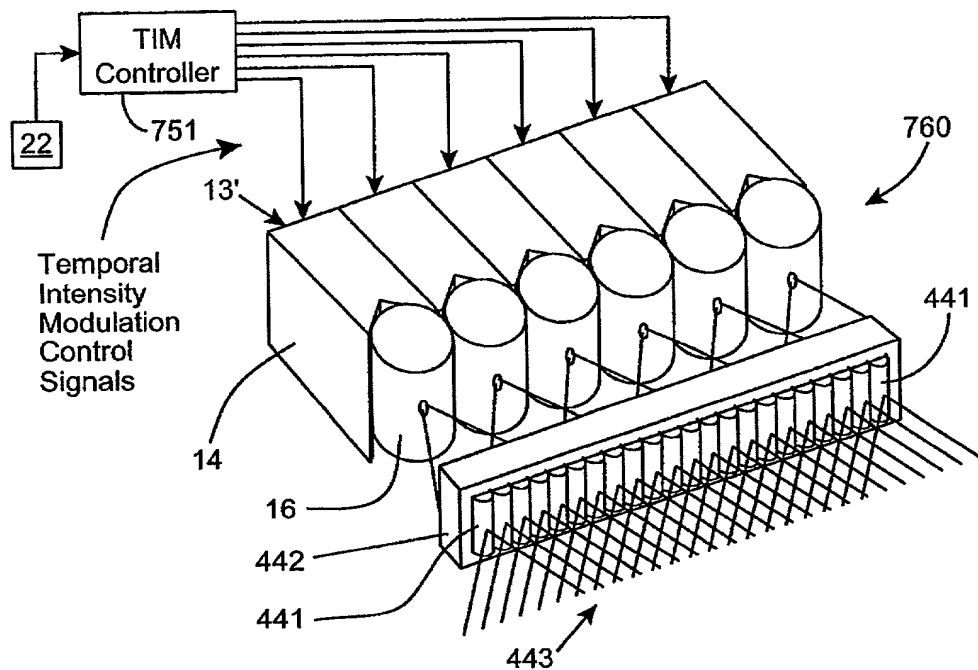


FIG. 1115C

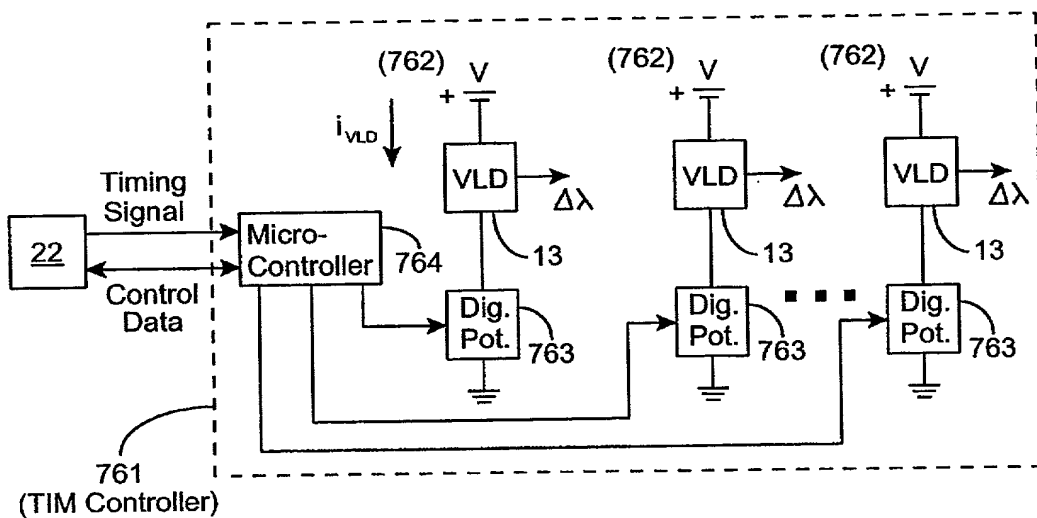


FIG. 1115D

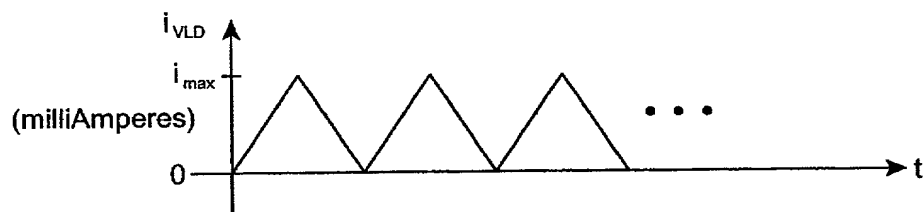


FIG. 1115E

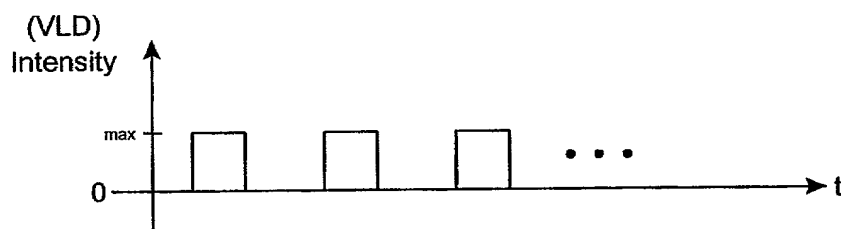


FIG. 1115F

Third Generalized Method Of  
Reducing Speckle-Noise Patterns  
At Image Detection Array  
Of The IFD Subsystem (3).

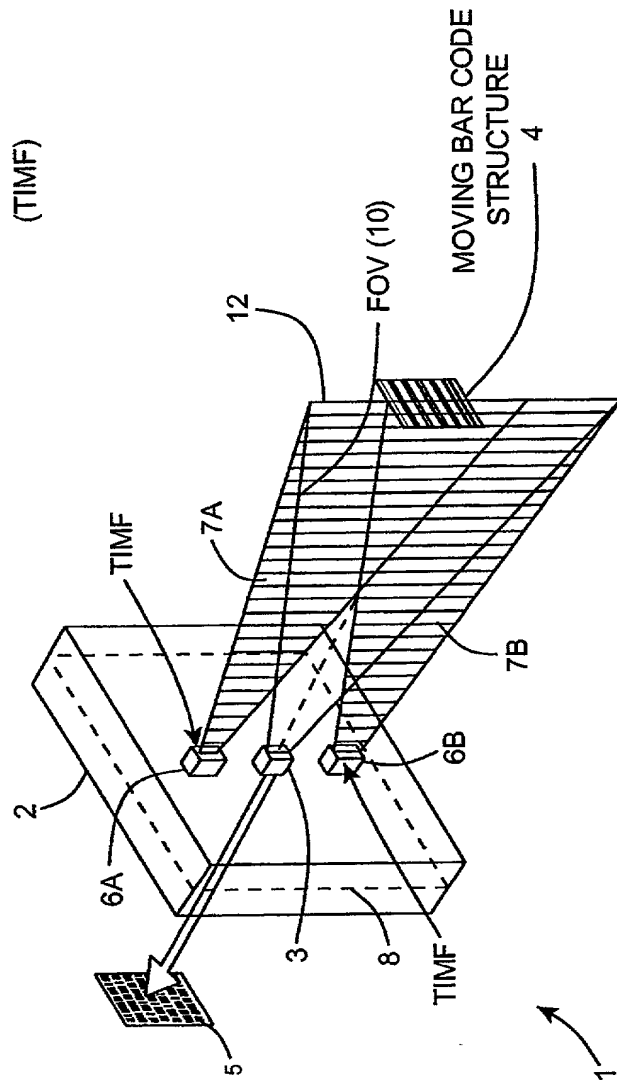


FIG. 1116

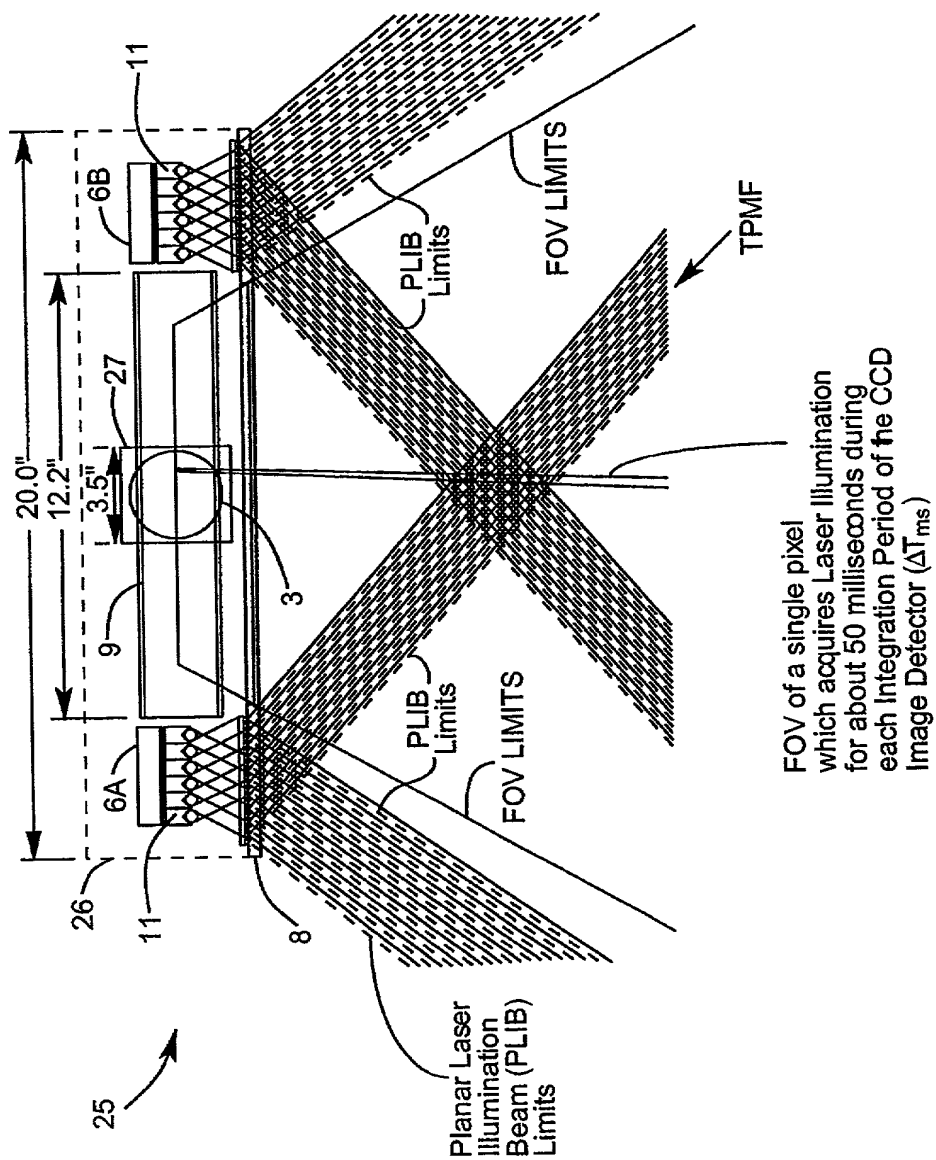


FIG. 1116A



THE THIRD GENERALIZED SPECKLE-NOISE PATTERN REDUCTION  
METHOD OF THE PRESENT INVENTION

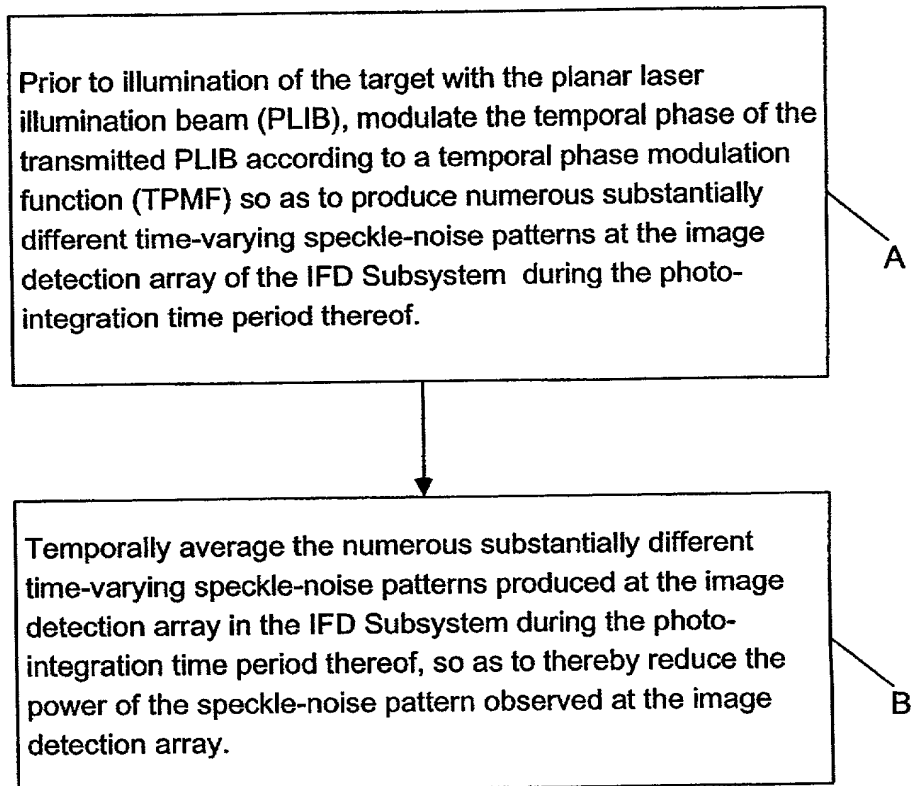


FIG. 1116B

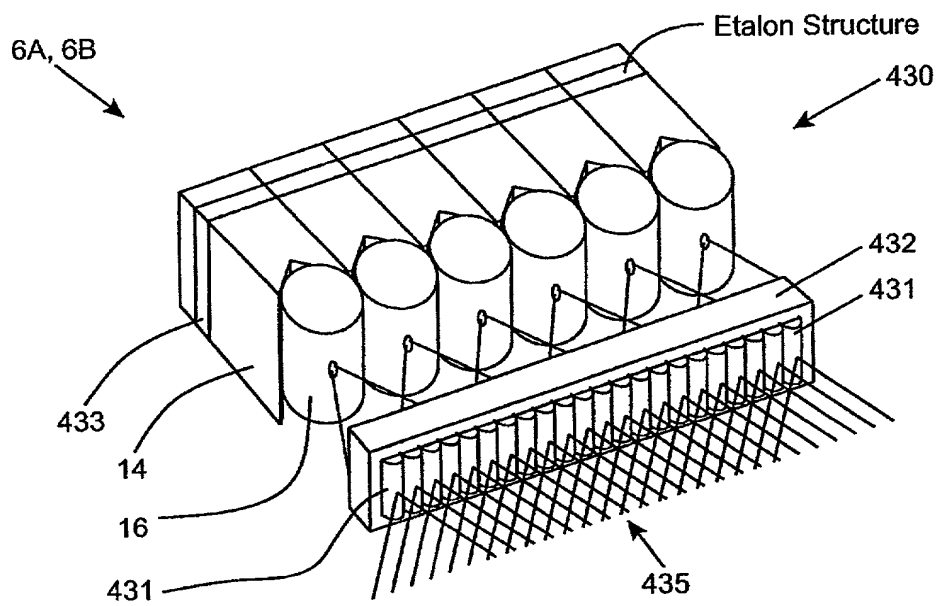


FIG. 1117A

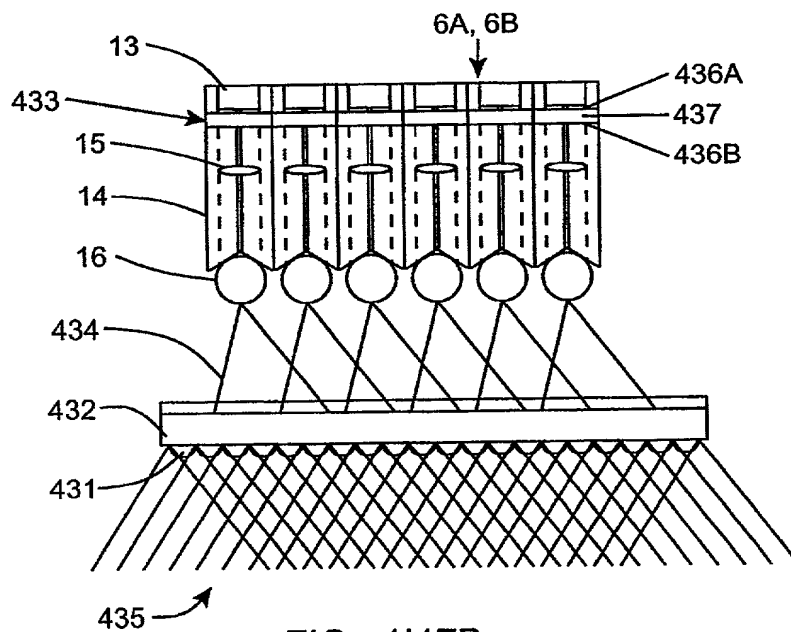


FIG. 1117B

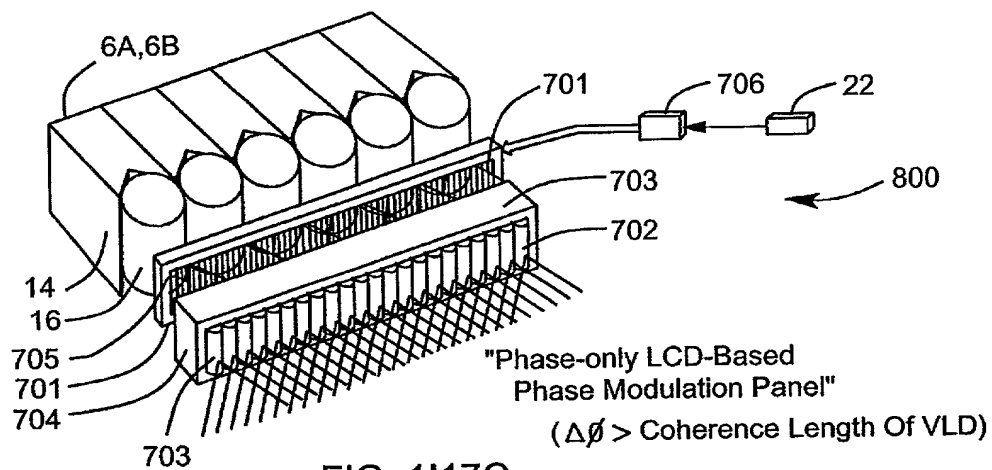


FIG. 1117C

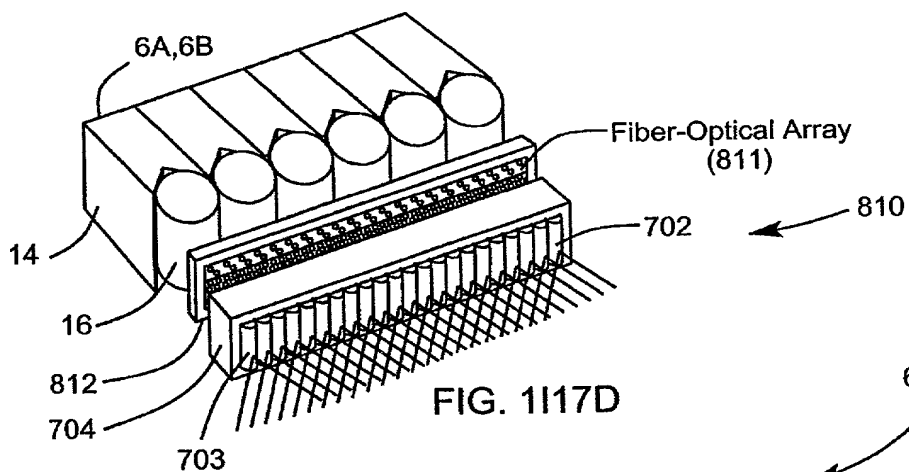


FIG. 1117D

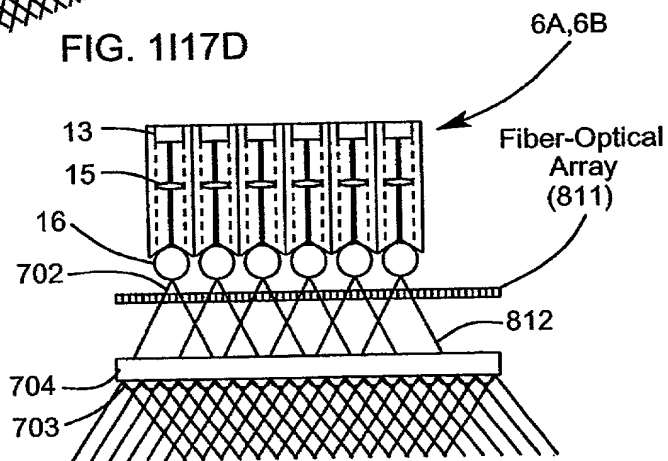


FIG. 1117E

Fourth Generalized Method Of  
Reducing Speckle-Noise Patterns  
At Image Detection Array  
Of The IFD Subsystem (3)

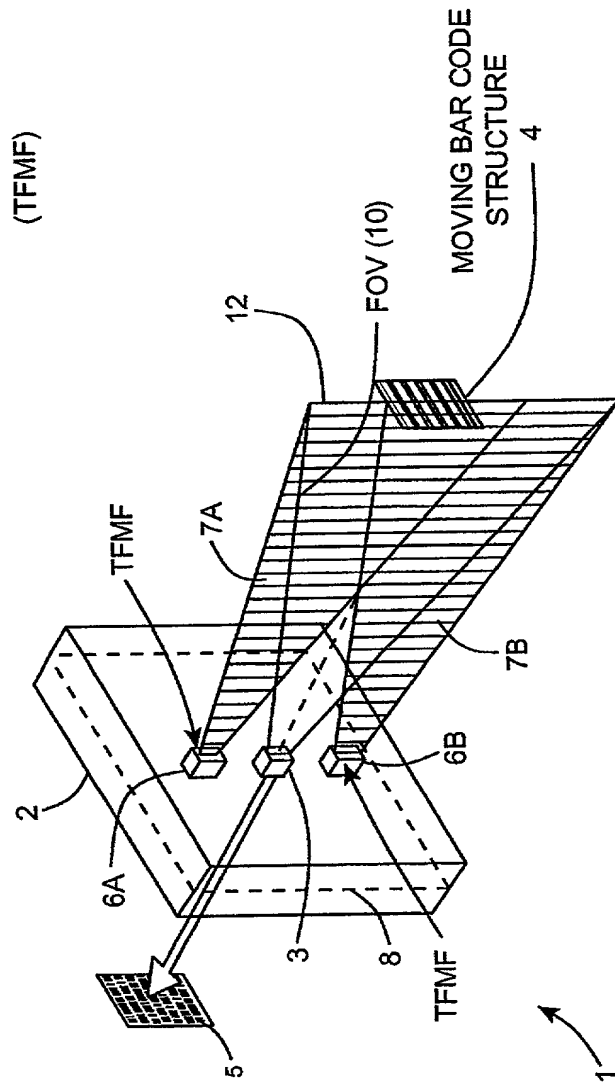


FIG. 1118

Chemical	Formula	Structure	Formula	Structure
Acetic acid	$\text{CH}_3\text{COOH}$		Formic acid	$\text{HCOOH}$
Acetic anhydride	$(\text{CH}_3\text{CO})_2\text{O}$		Formic anhydride	$(\text{HCO})_2\text{O}$
Acetic chloride	$\text{CH}_3\text{COCl}$		Formic chloride	$\text{HCOCl}$
Acetic bromide	$\text{CH}_3\text{COBr}$		Formic bromide	$\text{HCOBr}$
Acetic iodide	$\text{CH}_3\text{COI}$		Formic iodide	$\text{HCOI}$
Acetic fluoride	$\text{CH}_3\text{COF}$		Formic fluoride	$\text{HCOF}$
Acetic sulfide	$\text{CH}_3\text{COSCH}_3$		Formic sulfide	$(\text{HCO})_2\text{S}$
Acetic selenide	$\text{CH}_3\text{CSeSCH}_3$		Formic selenide	$(\text{HCO})_2\text{Se}$
Acetic telluride	$\text{CH}_3\text{CTeSCH}_3$		Formic telluride	$(\text{HCO})_2\text{Te}$
Acetic stannide	$\text{CH}_3\text{CSnSCH}_3$		Formic stannide	$(\text{HCO})_2\text{Sn}$
Acetic lead	$\text{CH}_3\text{CPbSCH}_3$		Formic lead	$(\text{HCO})_2\text{Pb}$
Acetic mercury	$\text{CH}_3\text{CHgSCH}_3$		Formic mercury	$(\text{HCO})_2\text{Hg}$
Acetic zinc	$\text{CH}_3\text{CHgSCH}_3$		Formic zinc	$(\text{HCO})_2\text{Zn}$
Acetic cadmium	$\text{CH}_3\text{CHgSCH}_3$		Formic cadmium	$(\text{HCO})_2\text{Cd}$
Acetic barium	$\text{CH}_3\text{CHgSCH}_3$		Formic barium	$(\text{HCO})_2\text{Ba}$
Acetic strontium	$\text{CH}_3\text{CHgSCH}_3$		Formic strontium	$(\text{HCO})_2\text{Sr}$
Acetic calcium	$\text{CH}_3\text{CHgSCH}_3$		Formic calcium	$(\text{HCO})_2\text{Ca}$
Acetic magnesium	$\text{CH}_3\text{CHgSCH}_3$		Formic magnesium	$(\text{HCO})_2\text{Mg}$
Acetic beryllium	$\text{CH}_3\text{CHgSCH}_3$		Formic beryllium	$(\text{HCO})_2\text{Be}$
Acetic aluminum	$\text{CH}_3\text{CHgSCH}_3$		Formic aluminum	$(\text{HCO})_2\text{Al}$
Acetic gallium	$\text{CH}_3\text{CHgSCH}_3$		Formic gallium	$(\text{HCO})_2\text{Ga}$
Acetic indium	$\text{CH}_3\text{CHgSCH}_3$		Formic indium	$(\text{HCO})_2\text{In}$
Acetic thallium	$\text{CH}_3\text{CHgSCH}_3$		Formic thallium	$(\text{HCO})_2\text{Tl}$
Acetic sodium	$\text{CH}_3\text{CHgSCH}_3$		Formic sodium	$(\text{HCO})_2\text{Na}$
Acetic potassium	$\text{CH}_3\text{CHgSCH}_3$		Formic potassium	$(\text{HCO})_2\text{K}$
Acetic rubidium	$\text{CH}_3\text{CHgSCH}_3$		Formic rubidium	$(\text{HCO})_2\text{Rb}$
Acetic cesium	$\text{CH}_3\text{CHgSCH}_3$		Formic cesium	$(\text{HCO})_2\text{Cs}$
Acetic francium	$\text{CH}_3\text{CHgSCH}_3$		Formic francium	$(\text{HCO})_2\text{Fr}$
Acetic actinium	$\text{CH}_3\text{CHgSCH}_3$		Formic actinium	$(\text{HCO})_2\text{Ac}$
Acetic thorium	$\text{CH}_3\text{CHgSCH}_3$		Formic thorium	$(\text{HCO})_2\text{Th}$
Acetic uranium	$\text{CH}_3\text{CHgSCH}_3$		Formic uranium	$(\text{HCO})_2\text{U}$
Acetic neptunium	$\text{CH}_3\text{CHgSCH}_3$		Formic neptunium	$(\text{HCO})_2\text{Np}$
Acetic plutonium	$\text{CH}_3\text{CHgSCH}_3$		Formic plutonium	$(\text{HCO})_2\text{Pu}$
Acetic americium	$\text{CH}_3\text{CHgSCH}_3$		Formic americium	$(\text{HCO})_2\text{Am}$
Acetic curium	$\text{CH}_3\text{CHgSCH}_3$		Formic curium	$(\text{HCO})_2\text{Cm}$
Acetic berkelium	$\text{CH}_3\text{CHgSCH}_3$		Formic berkelium	$(\text{HCO})_2\text{Bk}$
Acetic californium	$\text{CH}_3\text{CHgSCH}_3$		Formic californium	$(\text{HCO})_2\text{Cf}$
Acetic einsteinium	$\text{CH}_3\text{CHgSCH}_3$		Formic einsteinium	$(\text{HCO})_2\text{Es}$
Acetic fermium	$\text{CH}_3\text{CHgSCH}_3$		Formic fermium	$(\text{HCO})_2\text{Fm}$
Acetic mendelevium	$\text{CH}_3\text{CHgSCH}_3$		Formic mendelevium	$(\text{HCO})_2\text{Md}</$

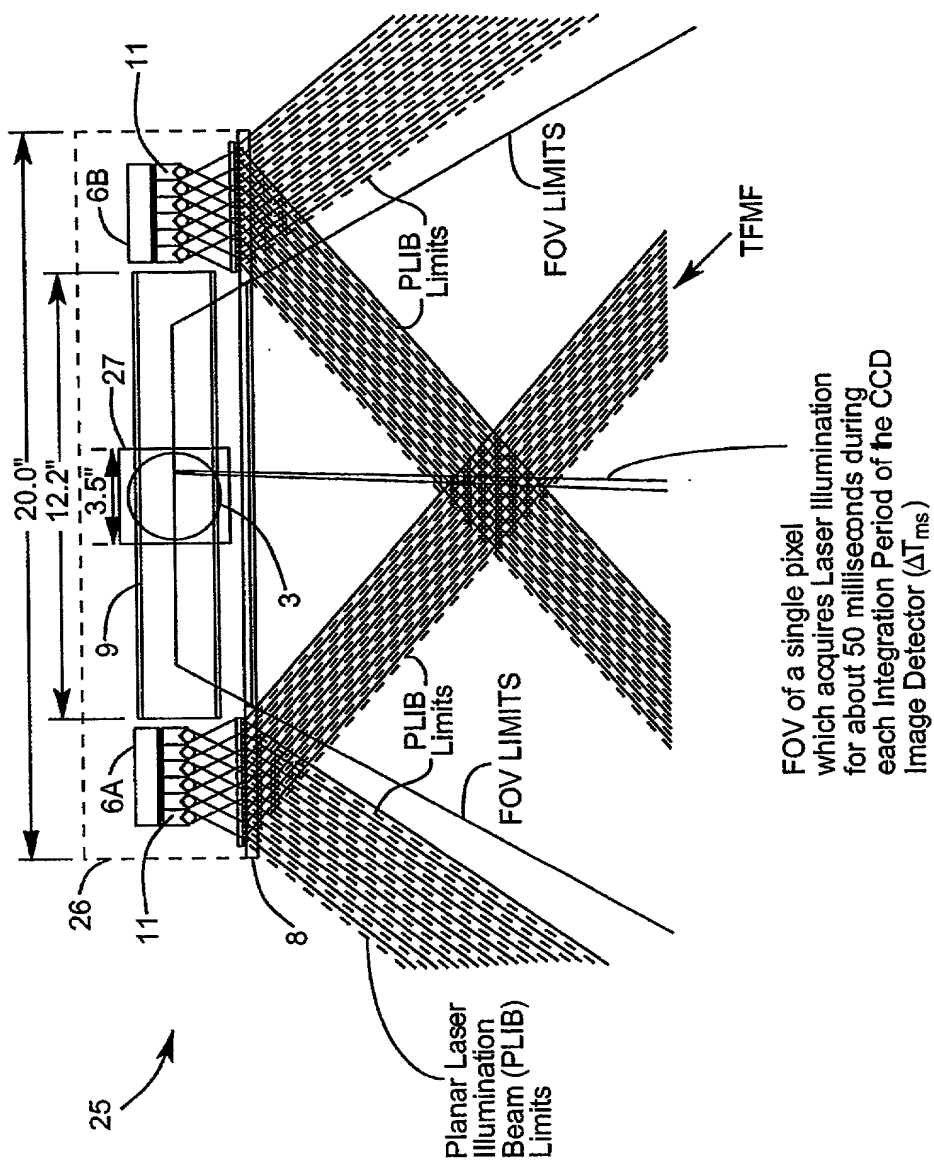


FIG. 1118A

THE FOURTH GENERALIZED SPECKLE-NOISE PATTERN REDUCTION  
METHOD OF THE PRESENT INVENTION

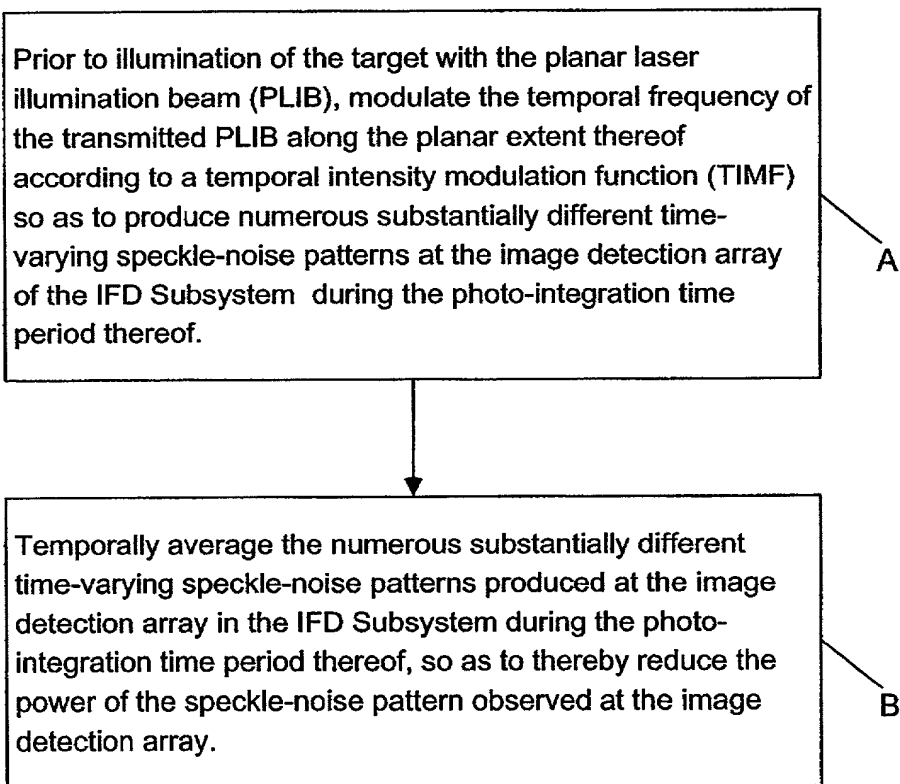
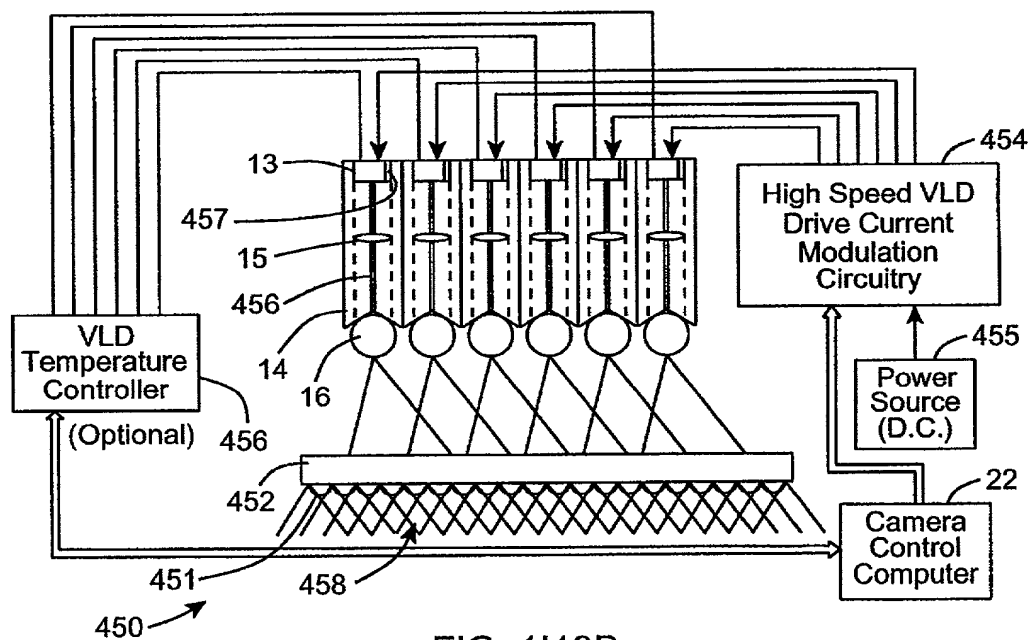
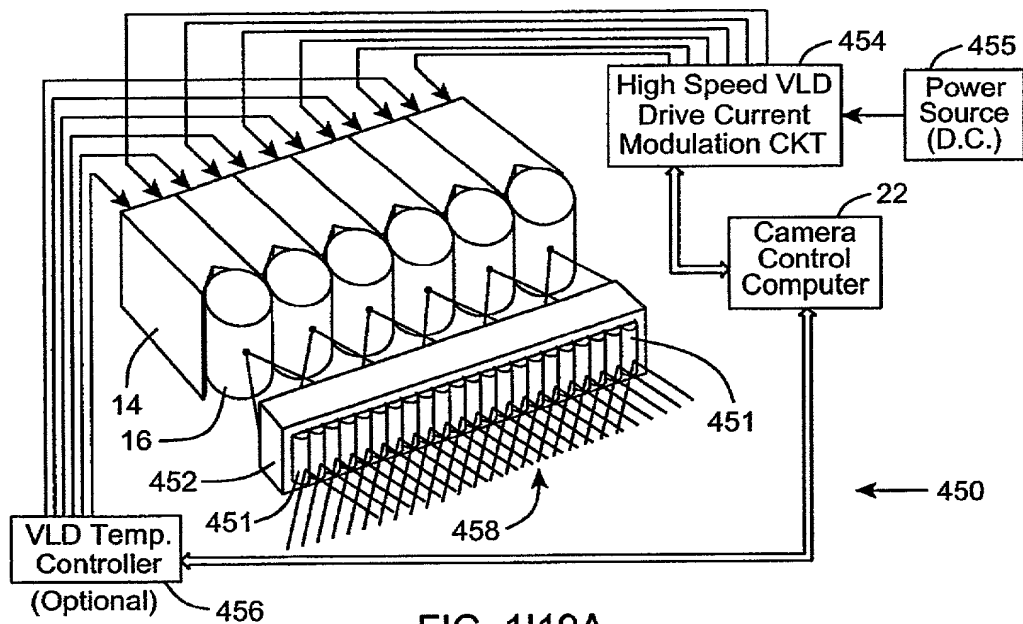


FIG. 1118B



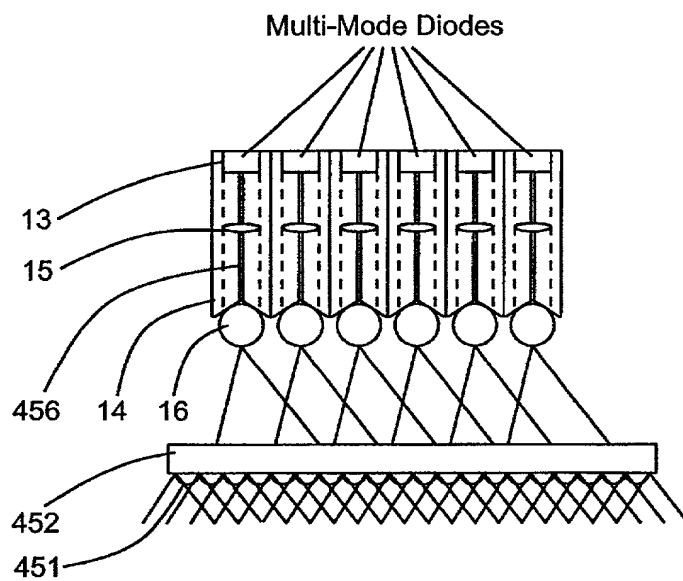


FIG. 1119C



Fifth Generalized Method Of  
Reducing Speckle-Noise Patterns  
At Image Detection Array  
Of The IFD Subsystem (3).

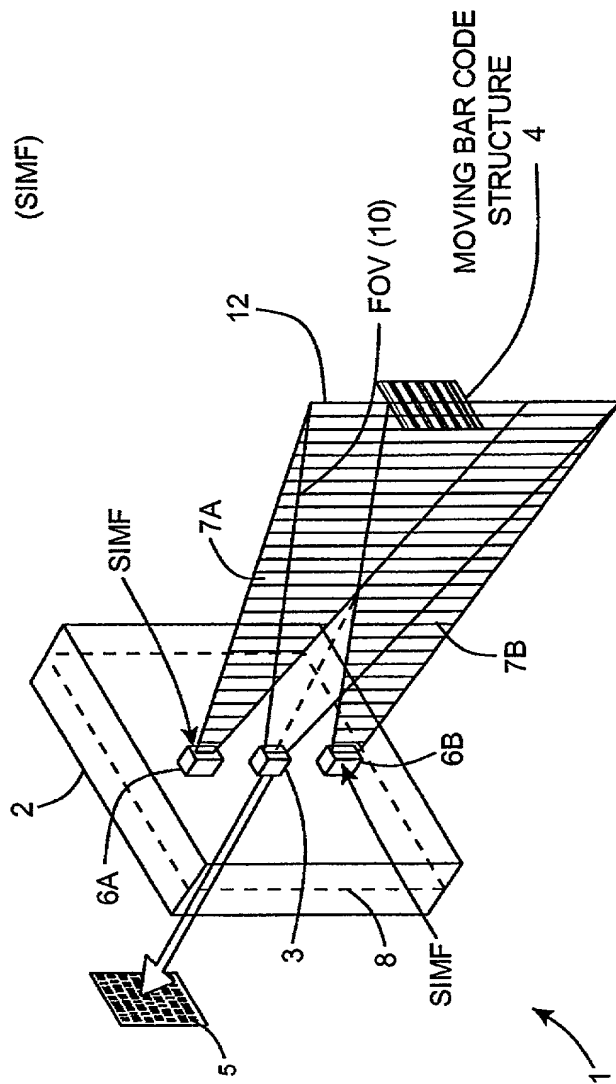


FIG. 1120

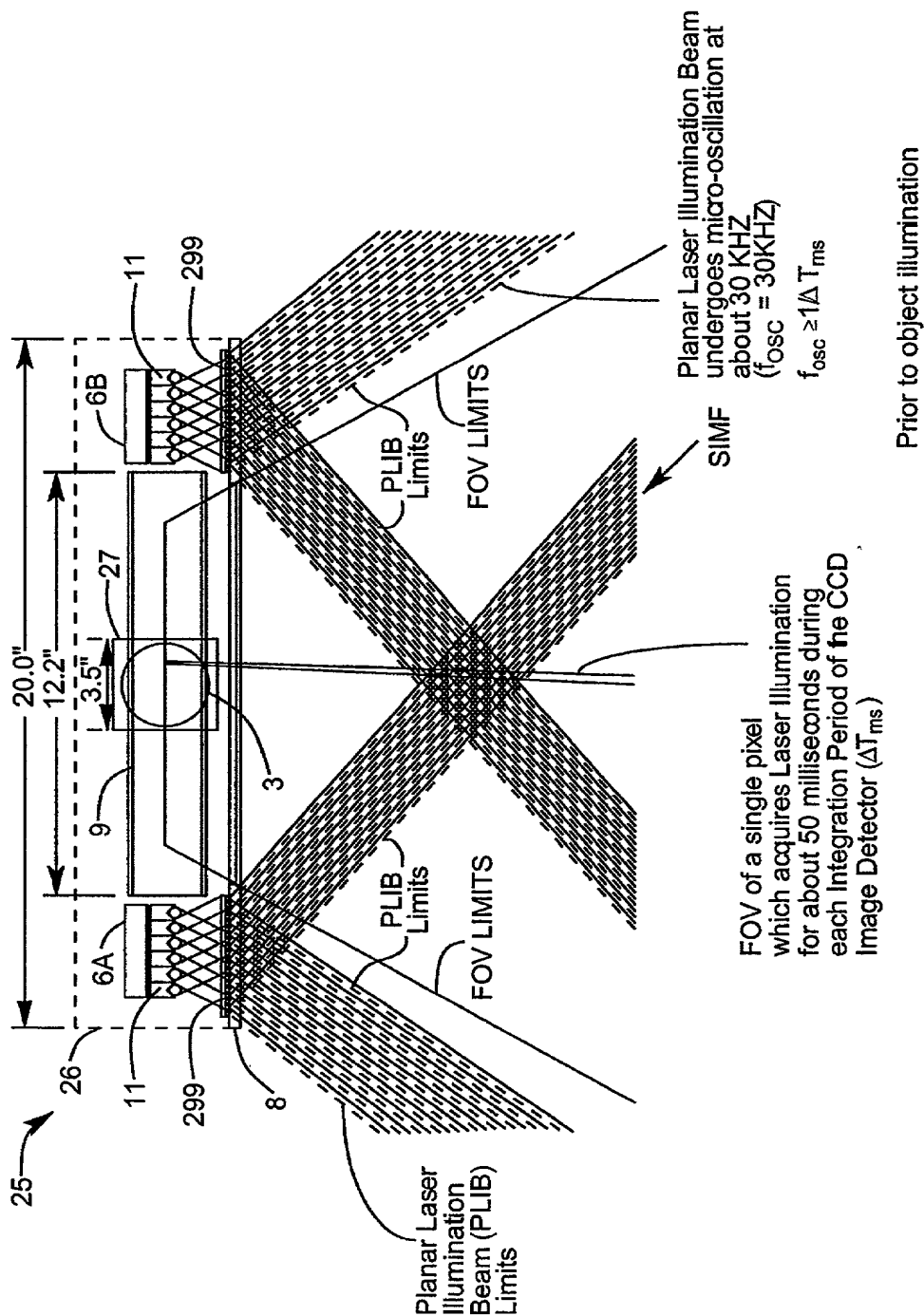


FIG. 1120A

THE FIFTH GENERALIZED SPECKLE-NOISE PATTERN REDUCTION  
METHOD OF THE PRESENT INVENTION

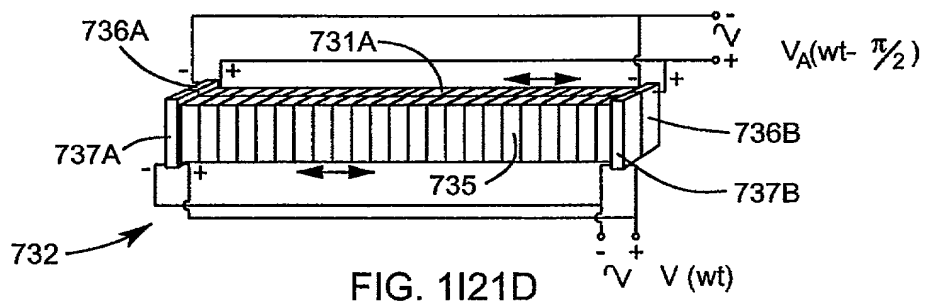
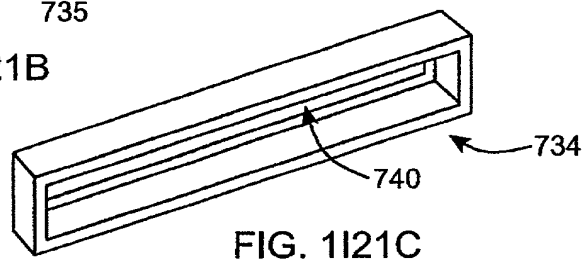
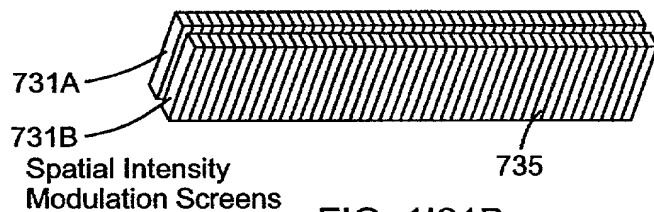
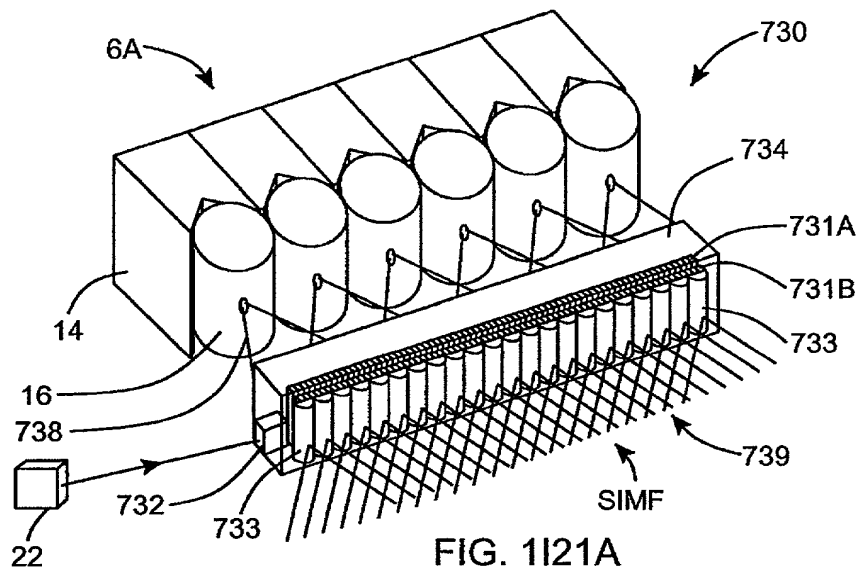
Prior to illumination of the target with the planar laser illumination beam (PLIB), modulate the spatial intensity of the transmitted PLIB along the planar extent thereof according to a spatial intensity modulation function (SIMF) so as to produce numerous substantially different time-varying speckle-noise patterns at the image detection array of the IFD Subsystem during the photo-integration time period thereof.

A

Temporally average the numerous substantially different time-varying speckle-noise patterns produced at the image detection array in the IFD Subsystem during the photo-integration time period thereof, so as to thereby reduce the power of the speckle-noise pattern observed at the image detection array.

B

FIG. 1I20B



Sixth Generalized Method Of  
Reducing Speckle-Noise Patterns  
At Image Detection Array  
Of The IFD Subsystem (3).

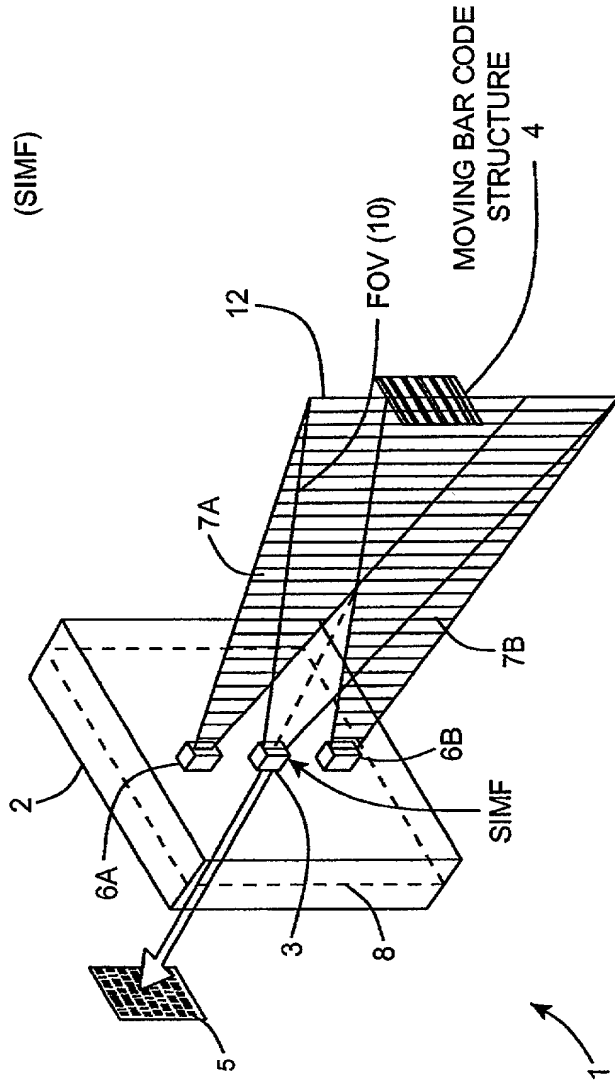


FIG. 1122

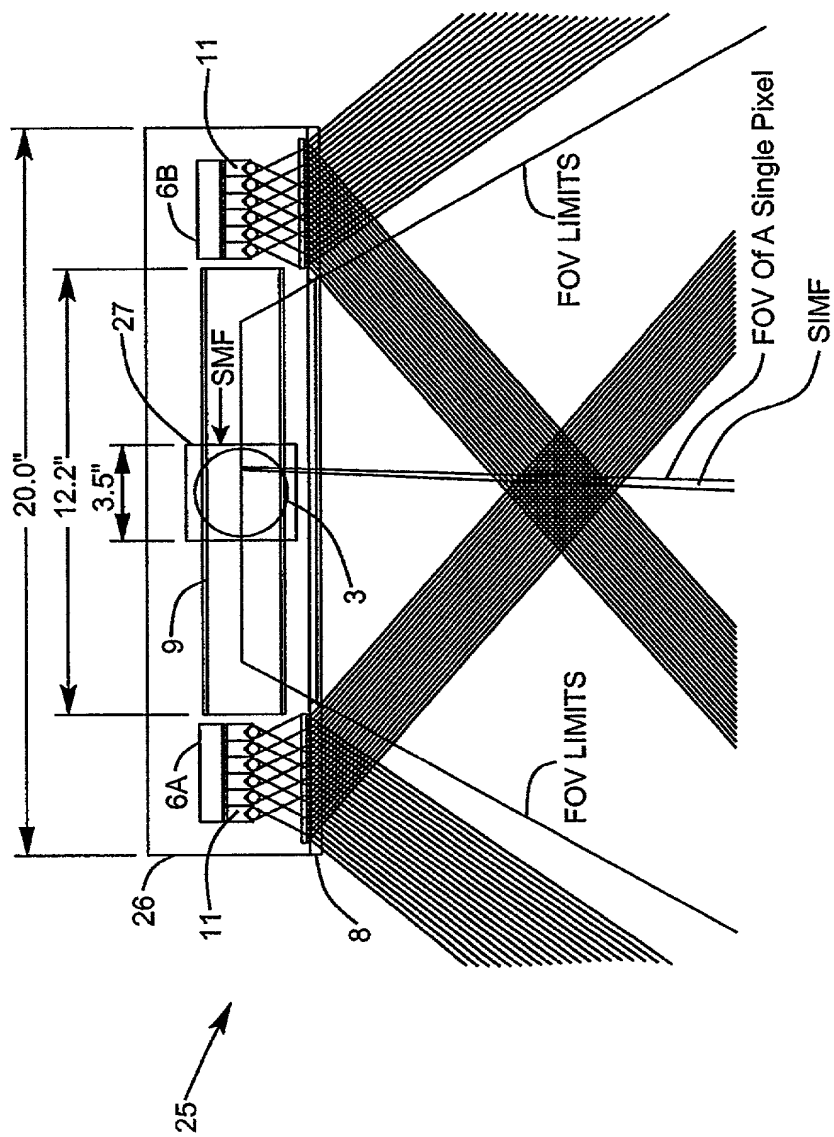


FIG. 1122A

THE SIXTH GENERALIZED SPECKLE-NOISE PATTERN REDUCTION  
METHOD OF THE PRESENT INVENTION

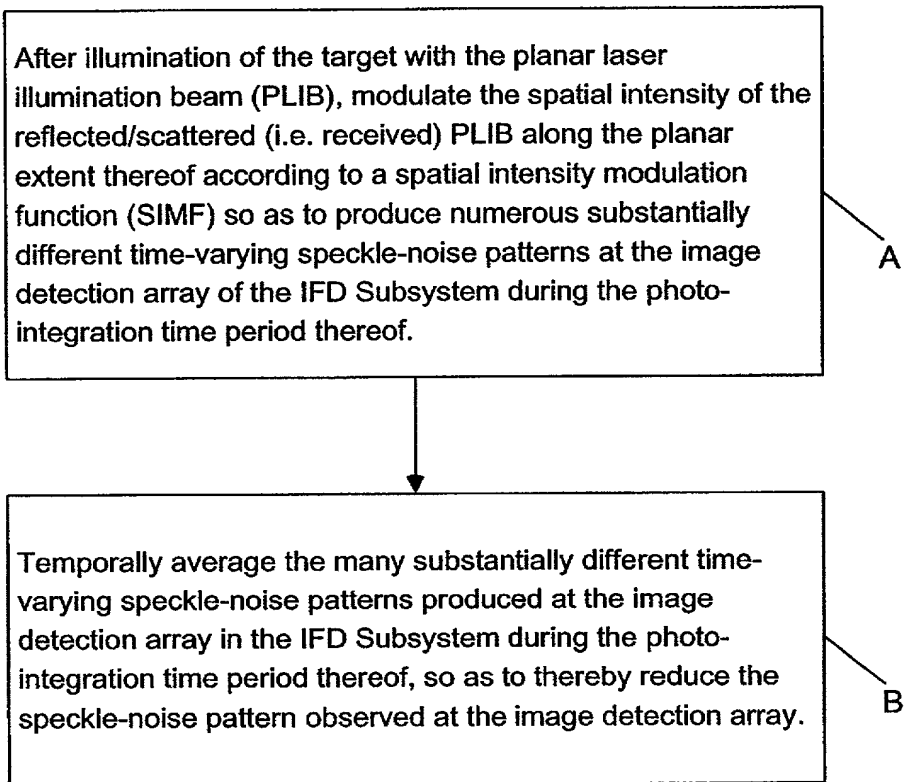


FIG. 1122B

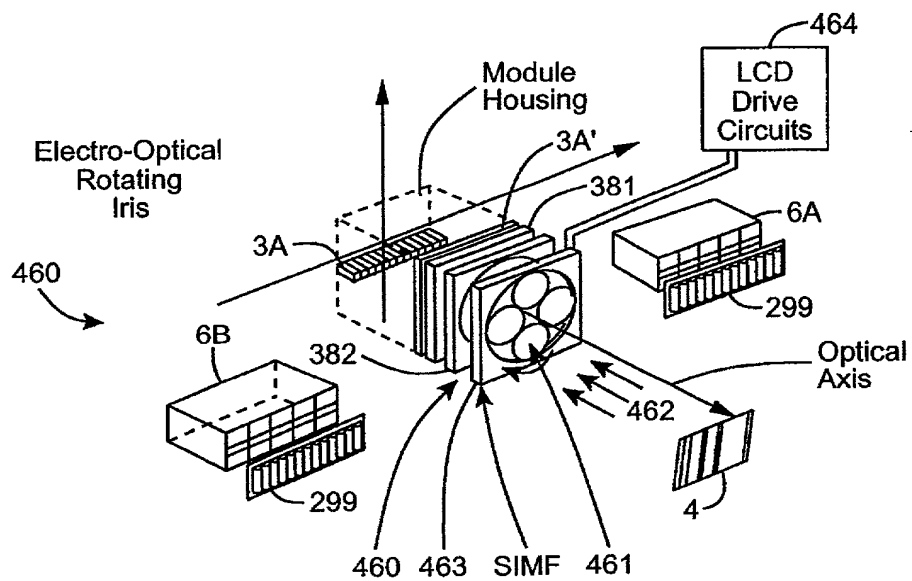


FIG. 1123A

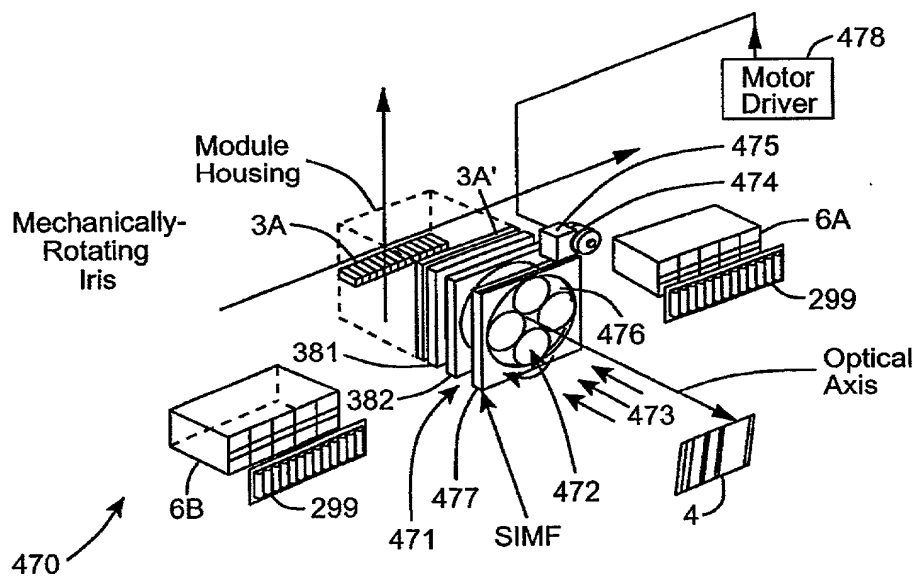


FIG. 1123B



## Seventh Generalized Method Of Reducing Speckle-Noise Patterns At Image Detection Array Of The IFD Subsystem (3)

(TIME)

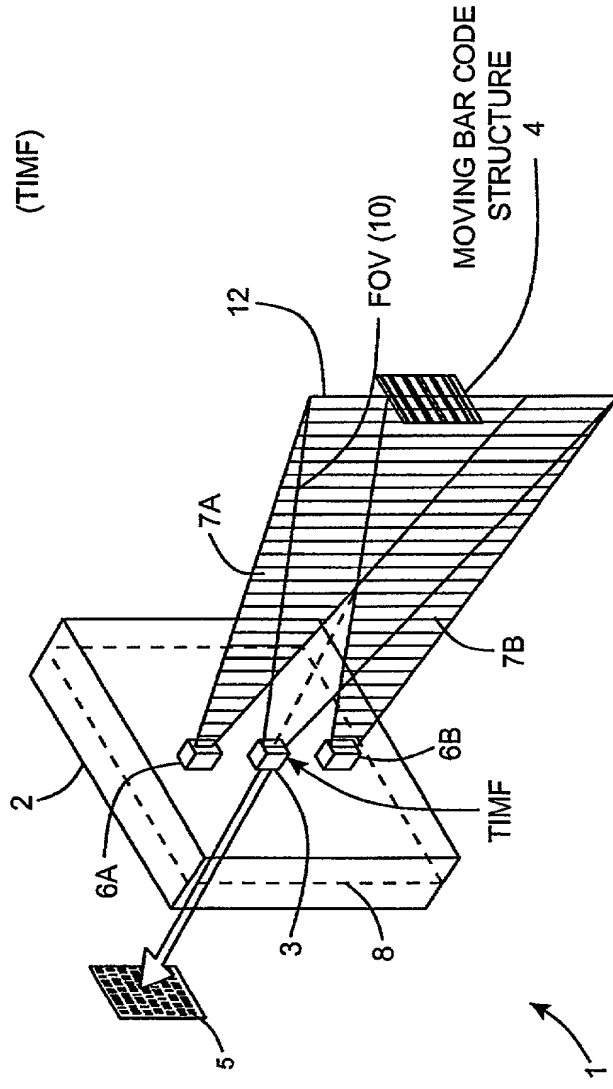


FIG. 1124

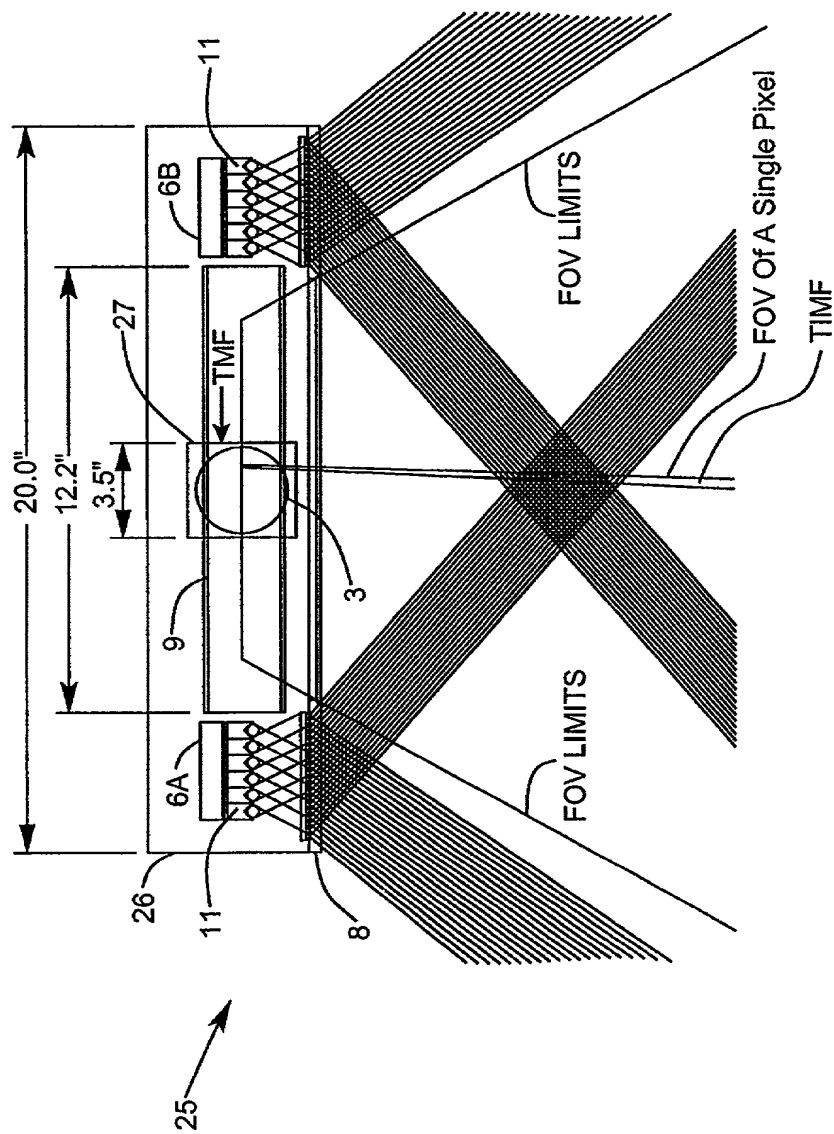


FIG. 1124A

THE SEVENTH GENERALIZED SPECKLE-NOISE PATTERN REDUCTION  
METHOD OF THE PRESENT INVENTION

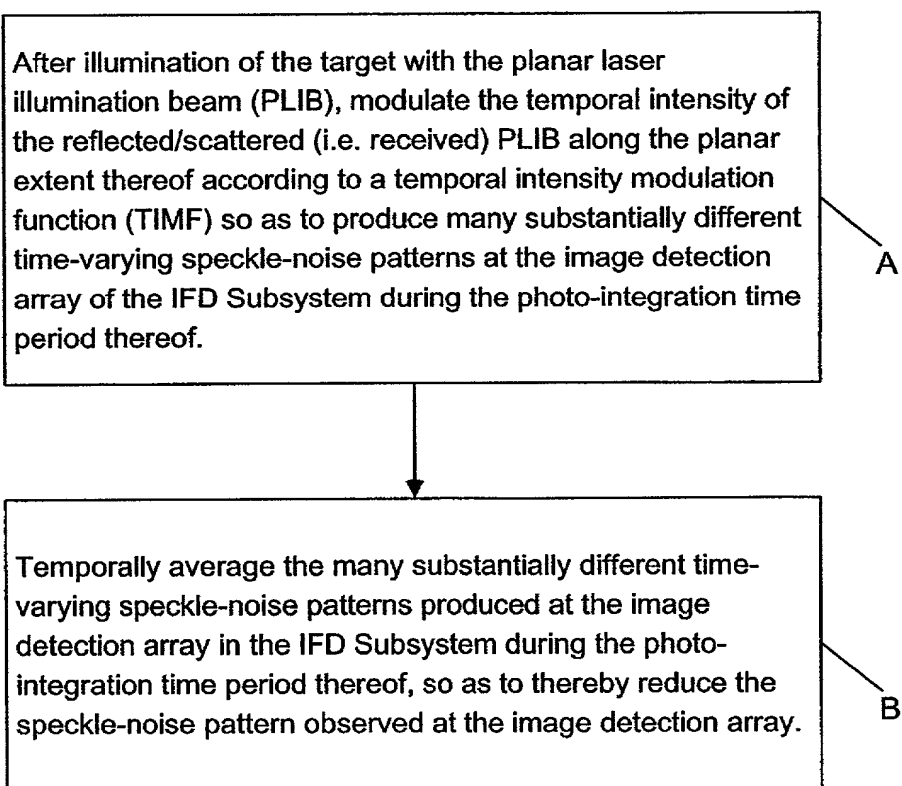


FIG. 1124B

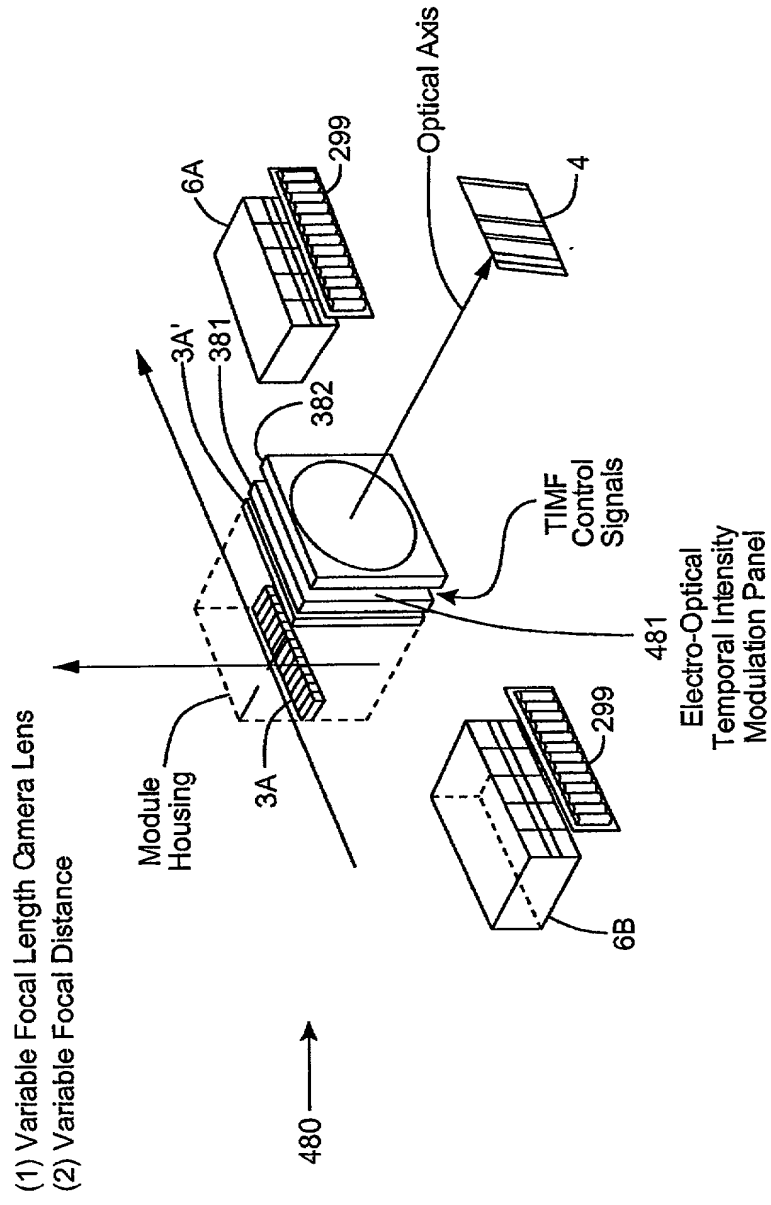
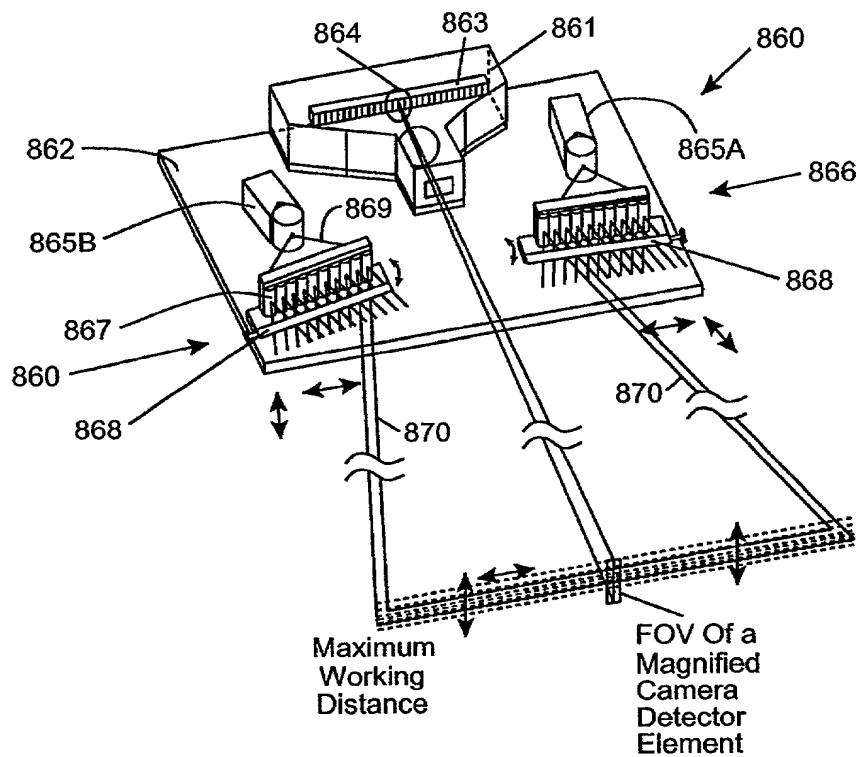


FIG. 1124C



\* Lateral And Transverse Micro-oscillation Of PLIB

FIG. 1I25A1

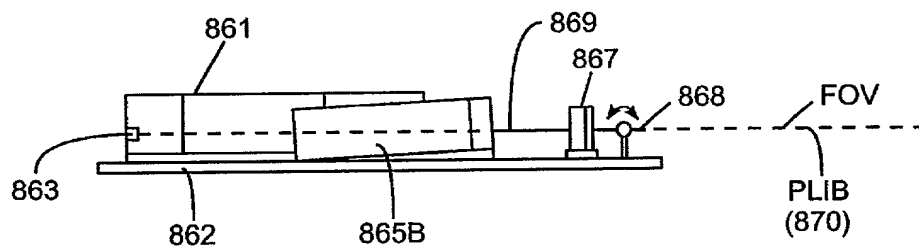
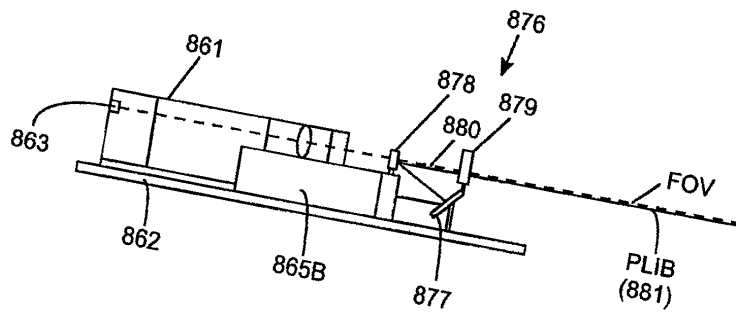
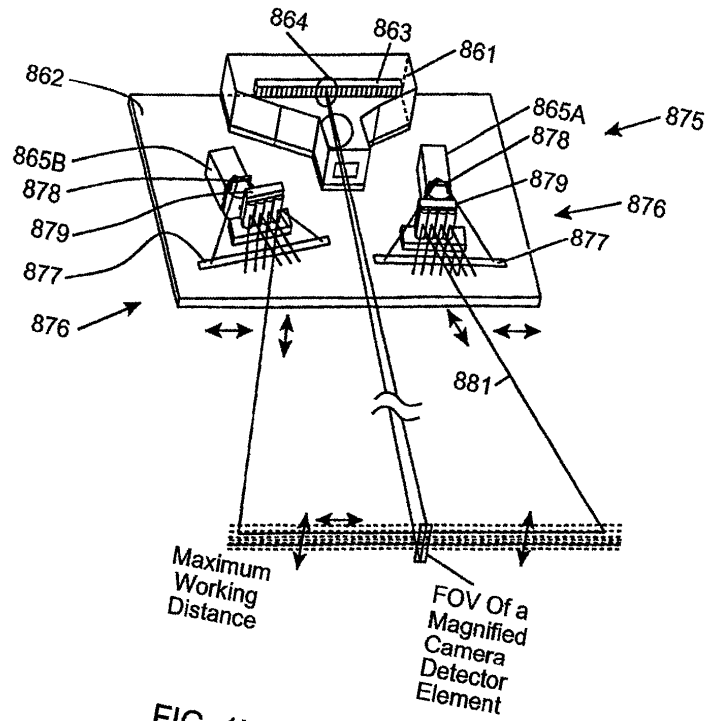
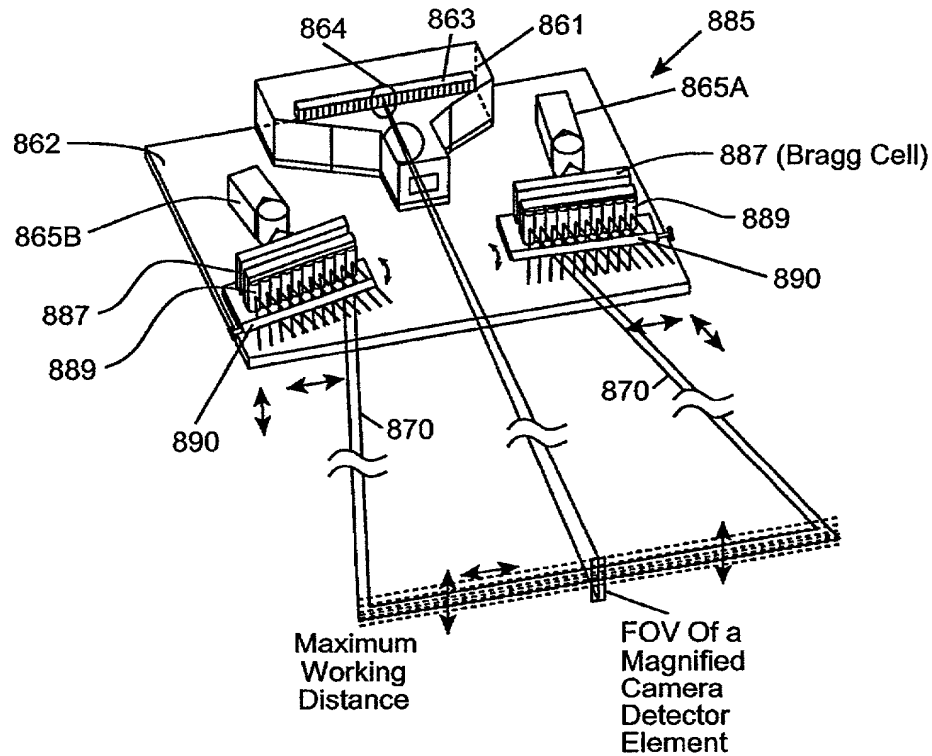


FIG. 1I25A2





\* Lateral And  
Transverse  
Micro-oscillation  
Of PLIB

FIG. 1125C1

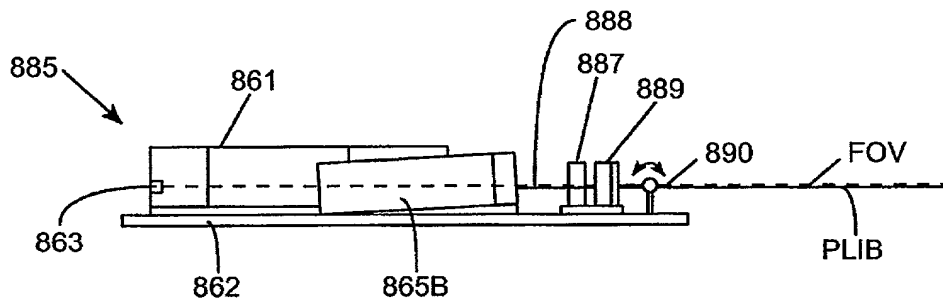


FIG. 1125C2

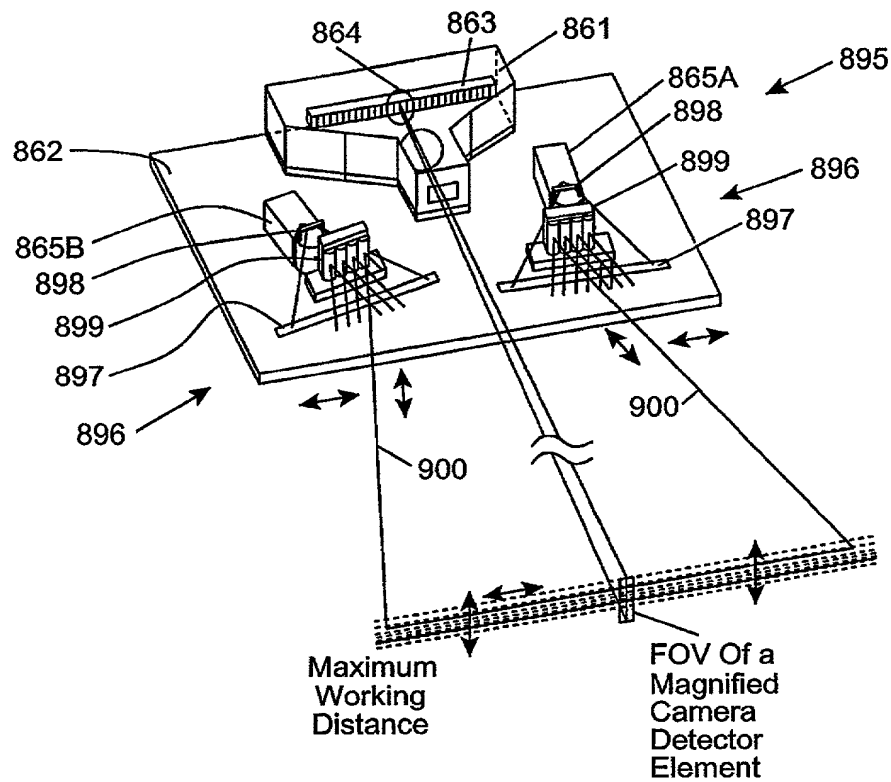


FIG. 1I25D1

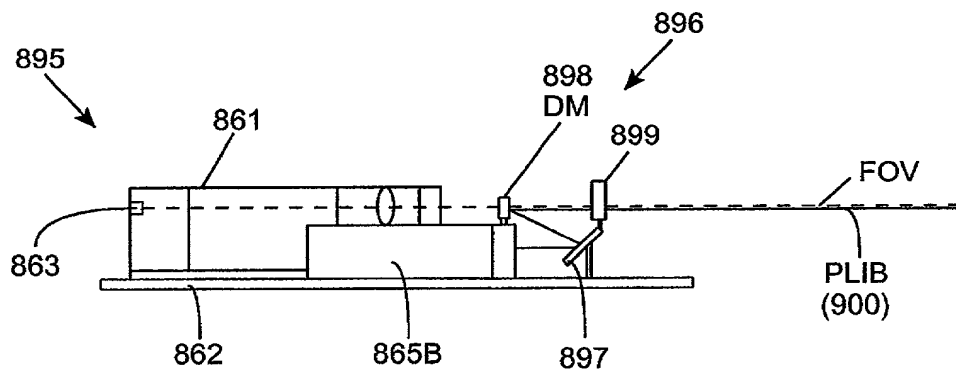


FIG. 1I25D2



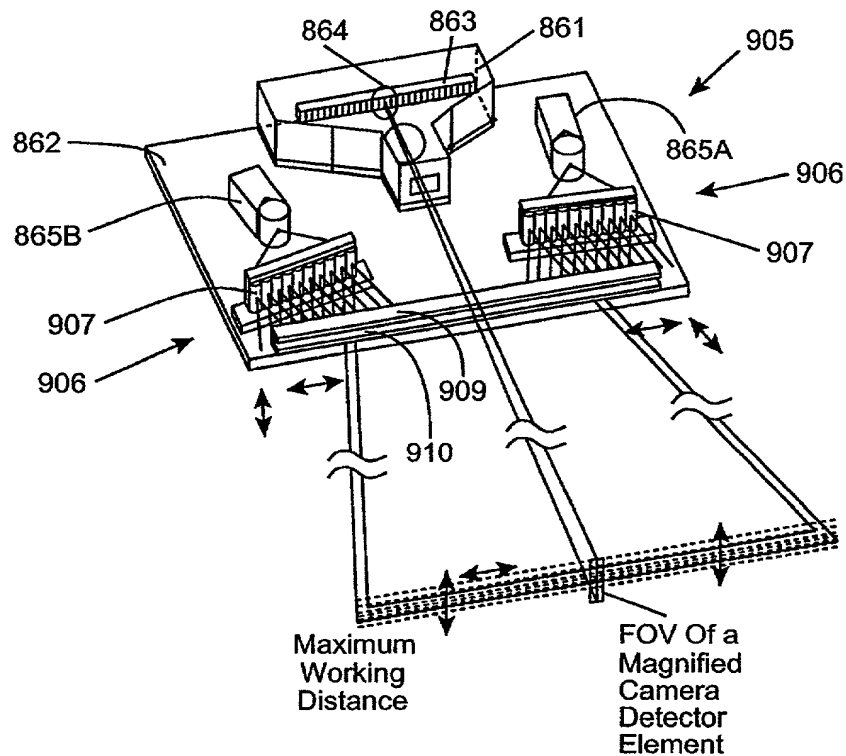


FIG. 1I25E1

\* Lateral And Transverse Micro-oscillation Of PLIB

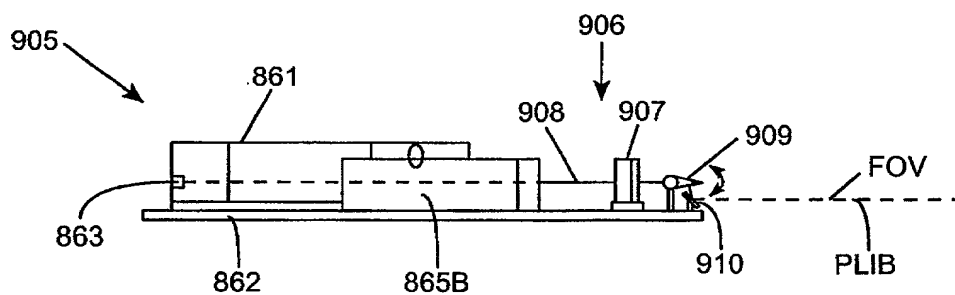
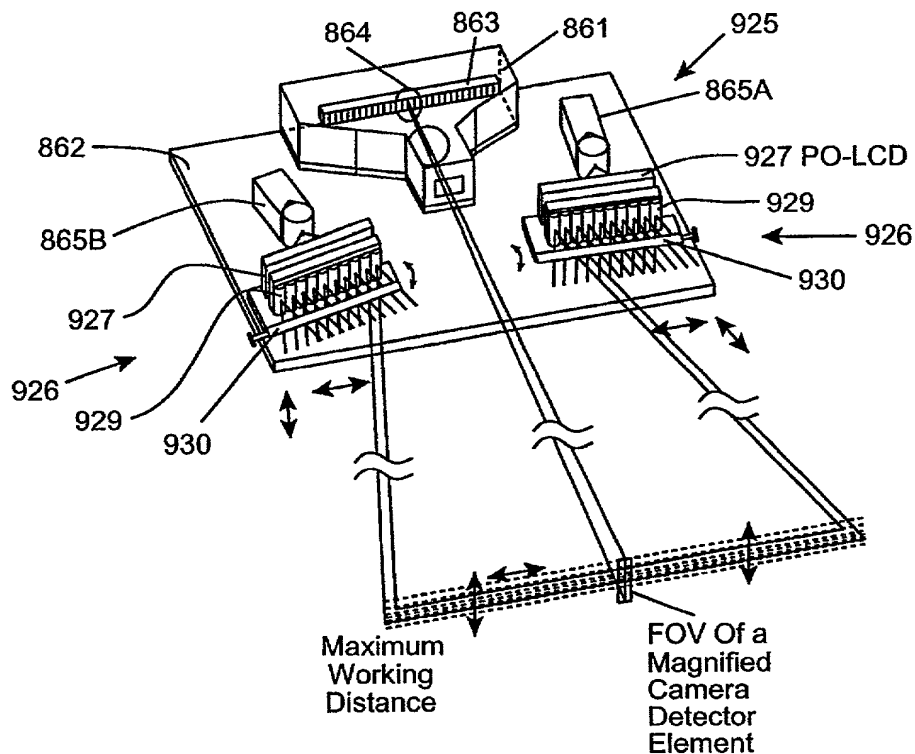


FIG. 1I25E2





\* Lateral And Transverse Micro-oscillation Of PLIB

FIG. 1I25G1

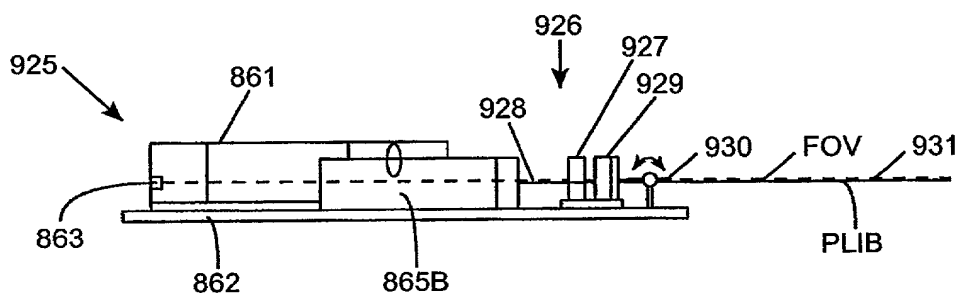


FIG. 1I25G2



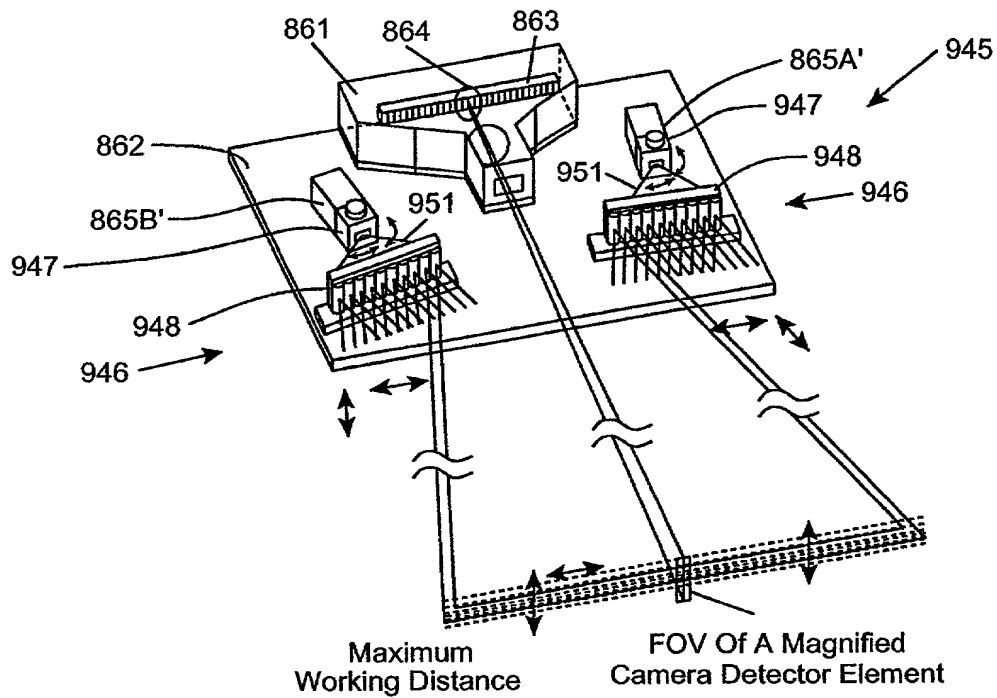


FIG. 1125I1

\* Lateral And Transverse Micro-oscillation Of PLIB

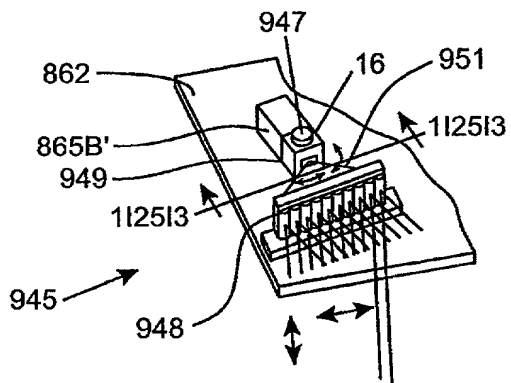


FIG. 1125I2

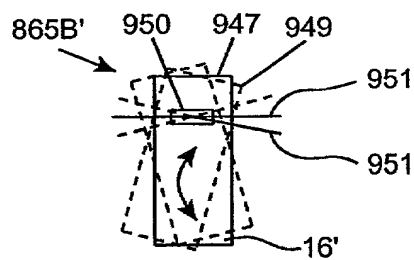


FIG. 1125I3

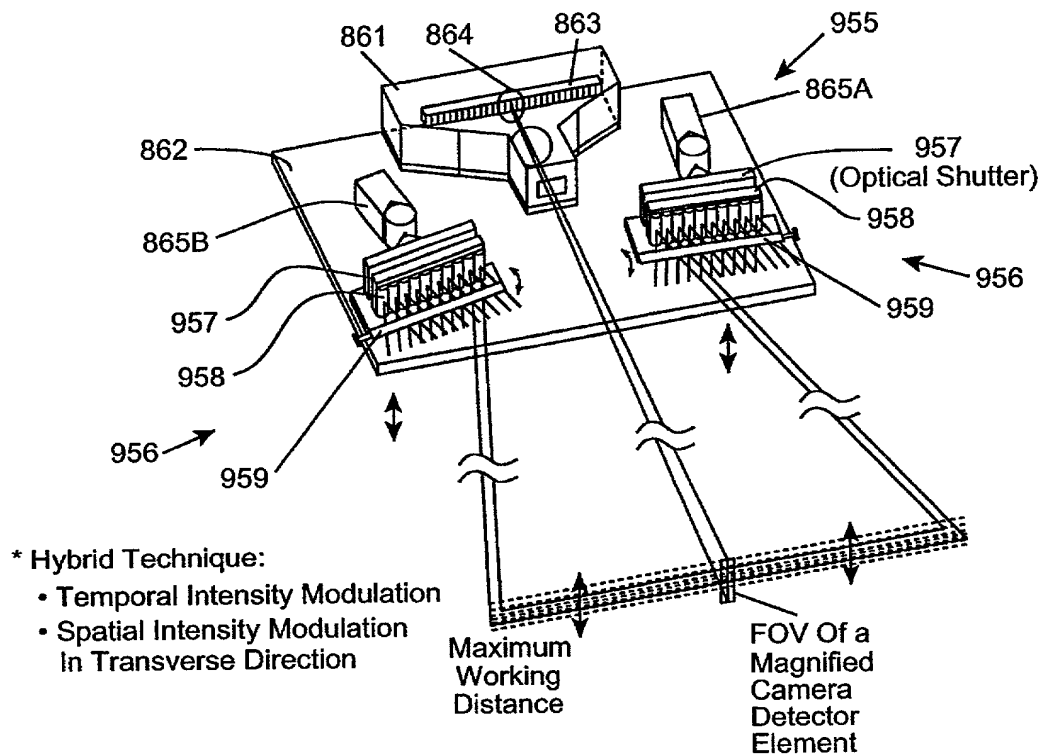


FIG. 1I25J1

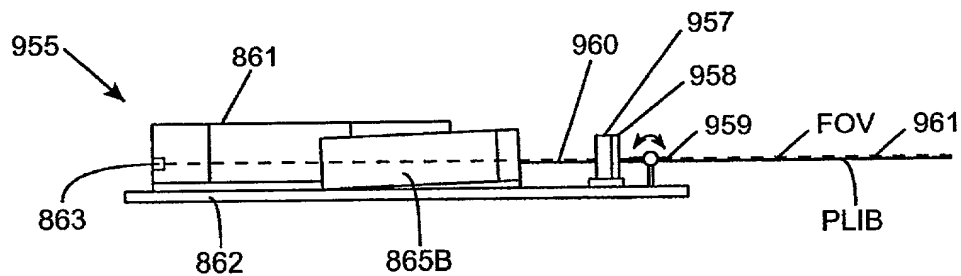


FIG. 1I25J2

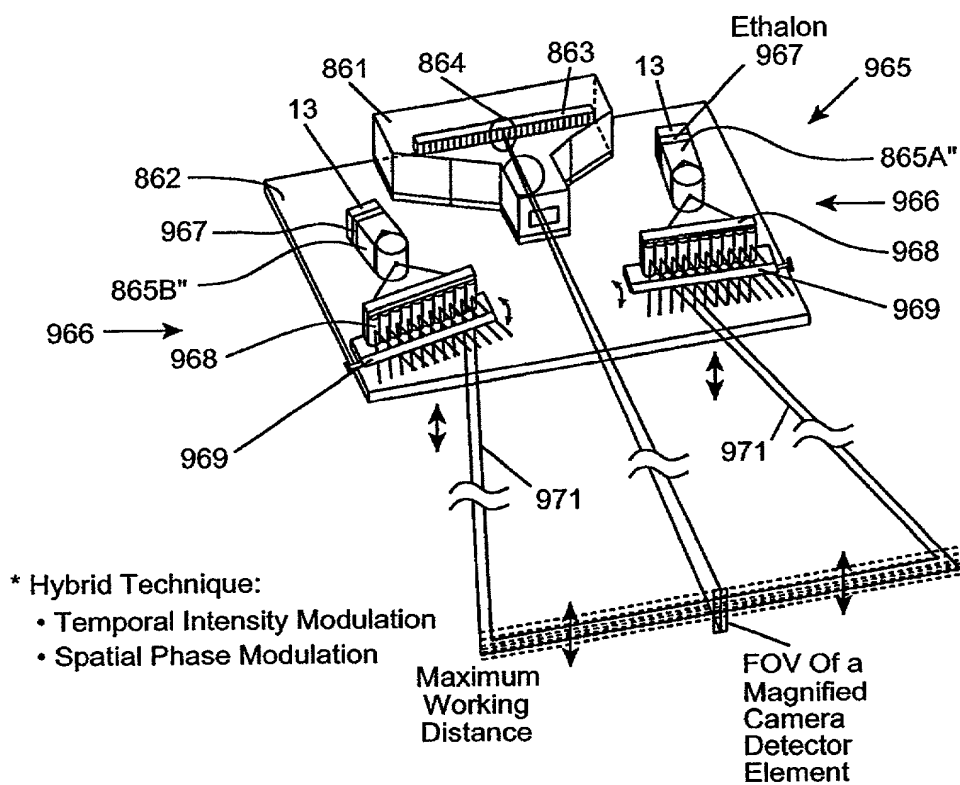


FIG. 1I25K1

\* Transverse Micro-oscillation Of PLIB

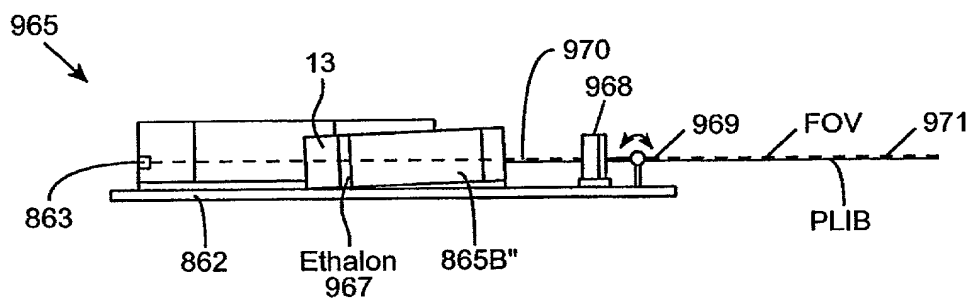


FIG. 1I25K2

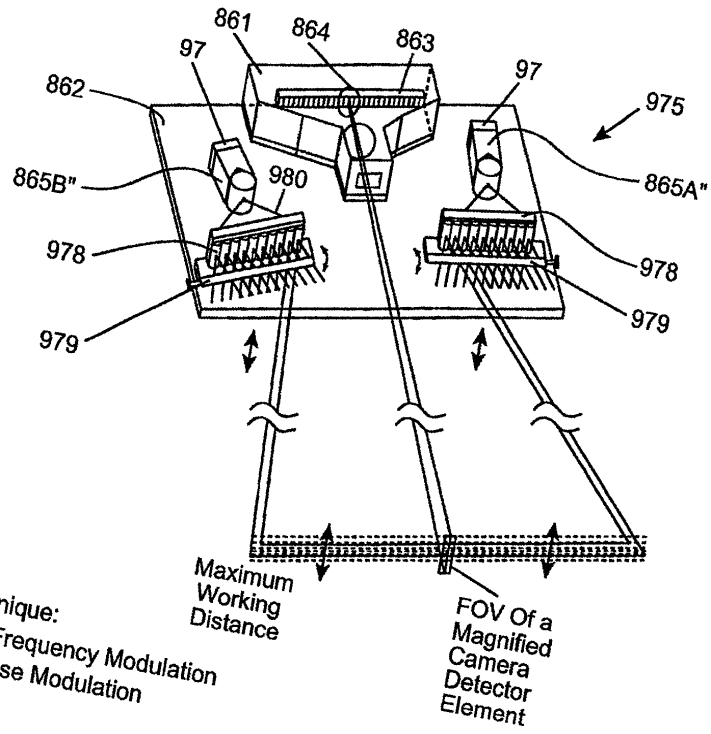
[illegible]

FIG. 1125L1

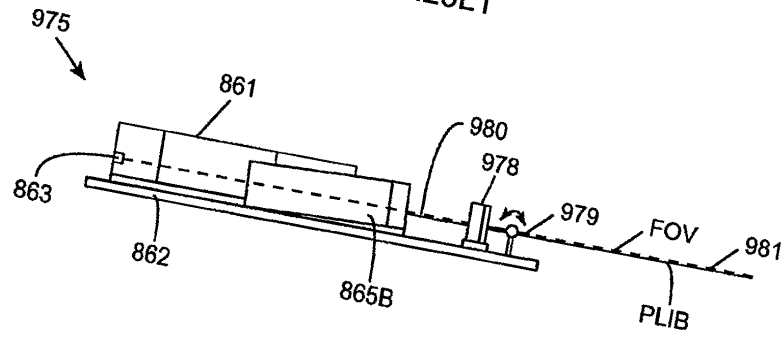
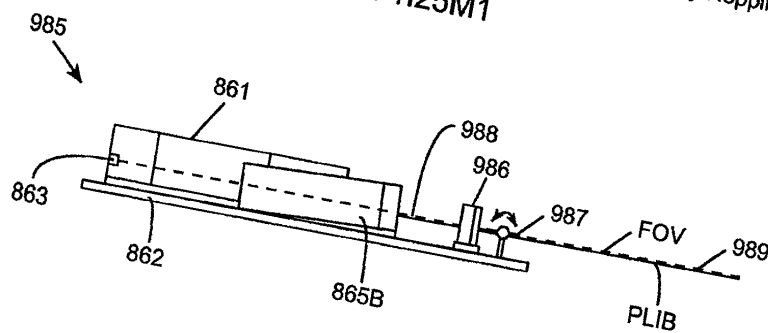
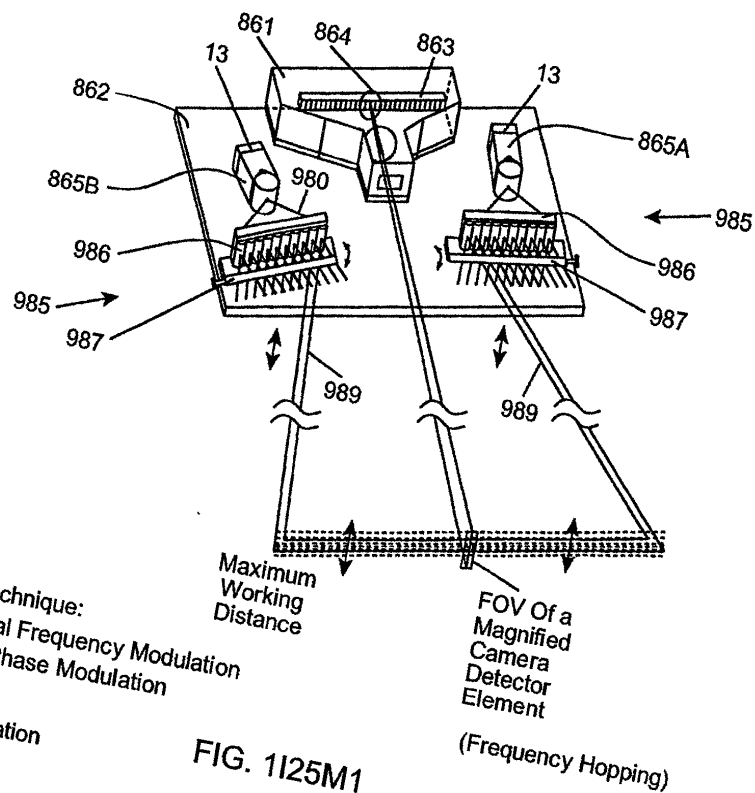


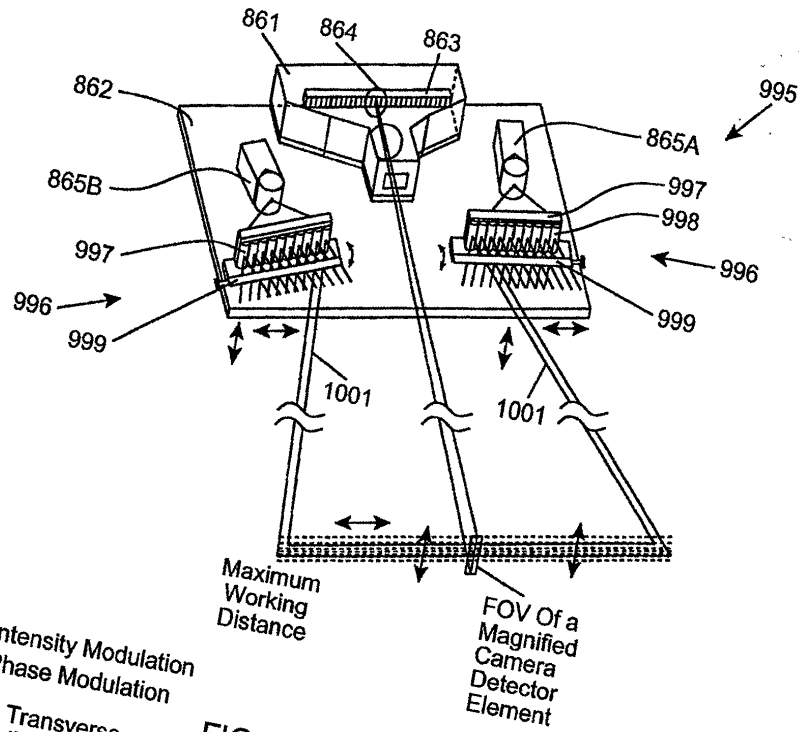
FIG. 1125L2



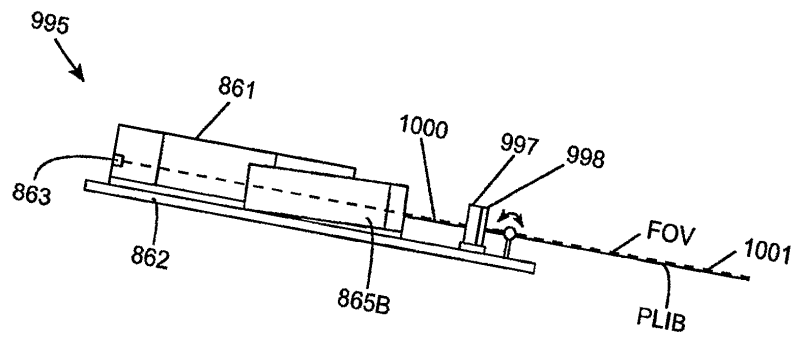
2000070432000



6051-10 0734377



- \* Hybrid:
  - Spatial Intensity Modulation
  - Spatial Phase Modulation
- \* Lateral And Transverse Micro-oscillation Of PLIB



Fixed Focal Length  
Lens Cases

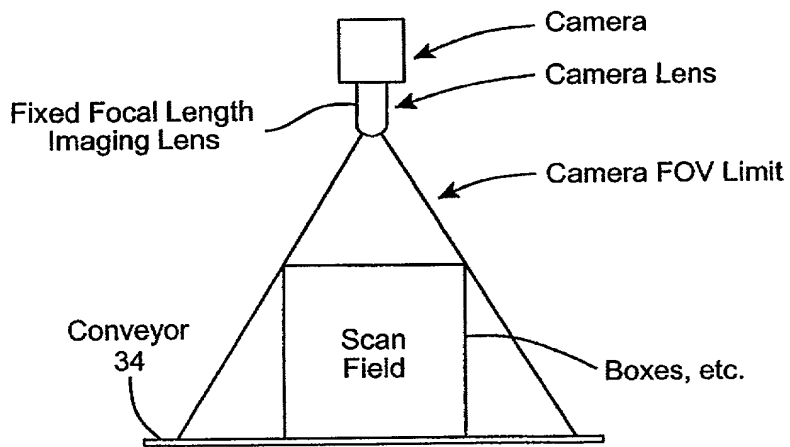


FIG. 1K1

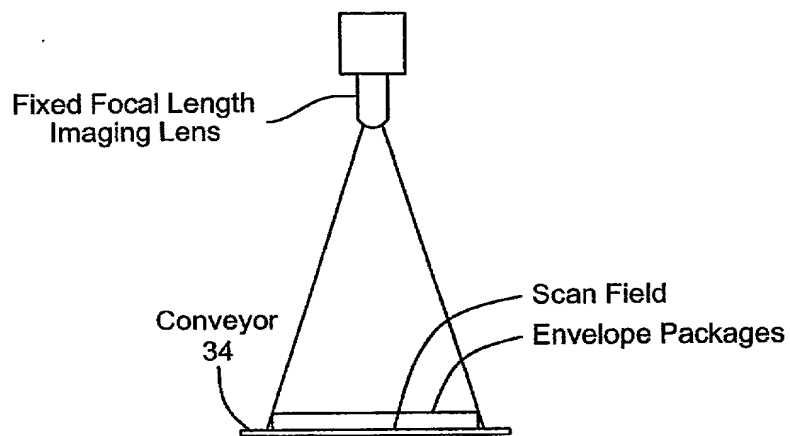


FIG. 1K2

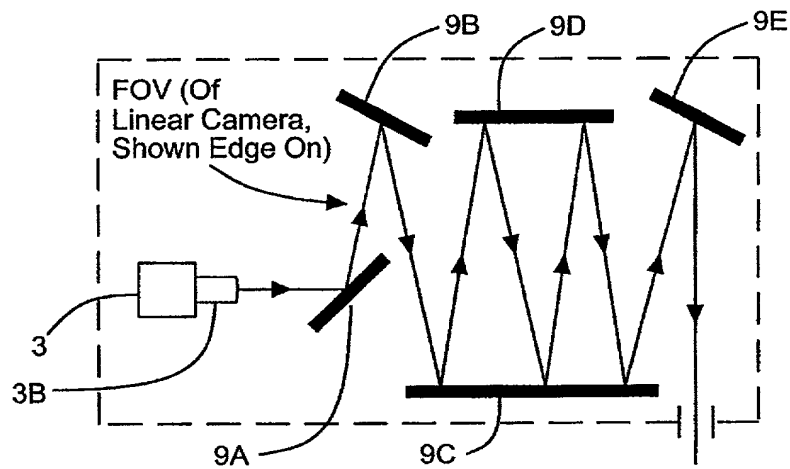


FIG. 1L1

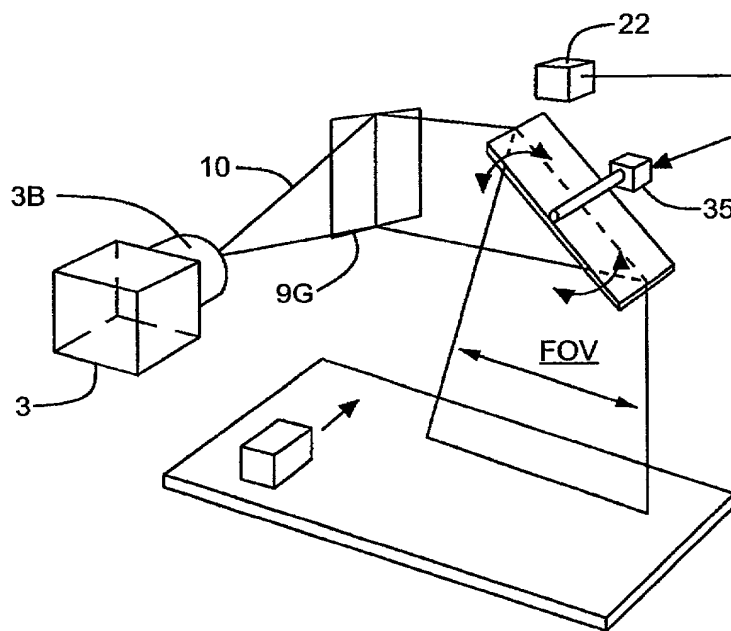


FIG. 1L2

Pixel Power Density vs. Object Distance (General Example)

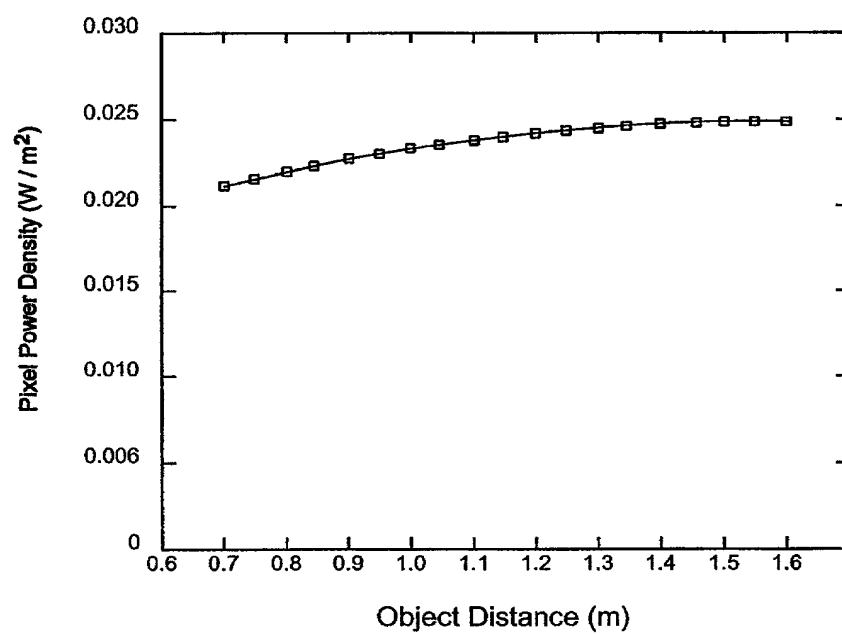


FIG. 1M1

Near And Far Object Distance Laser Power Distribution Data And Curve Fit

Power (Micro W)

Position Along Planar Laser Beam Width (m)

Legend:

- Near Object Distance Data
- Near Object Distance Fit
- △ Far Object Distance Data
- Far Object Distance Fit

FIG. 1M2

Planar Laser Beam Width vs. Object Distance

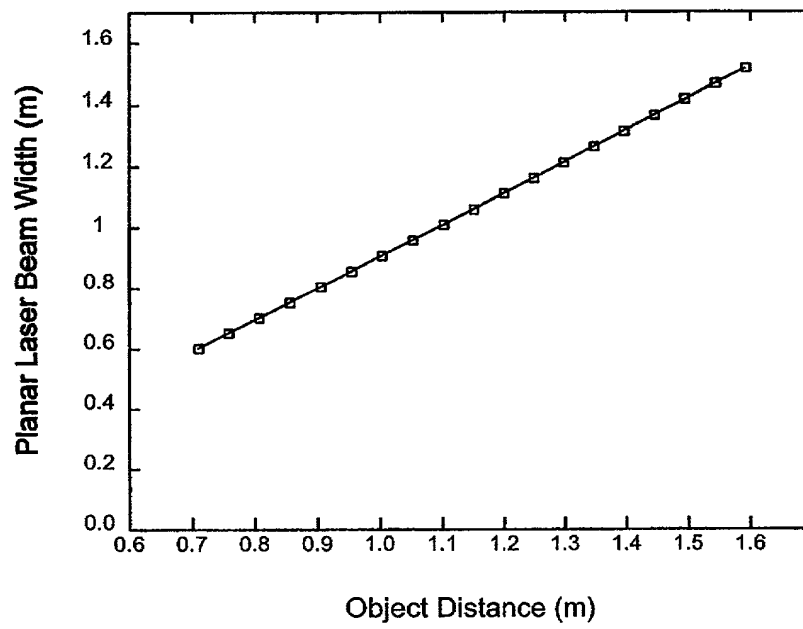


FIG. 1M3

Planar Laser Beam Height vs.  
Object Distance (Far Object Distance Focus)

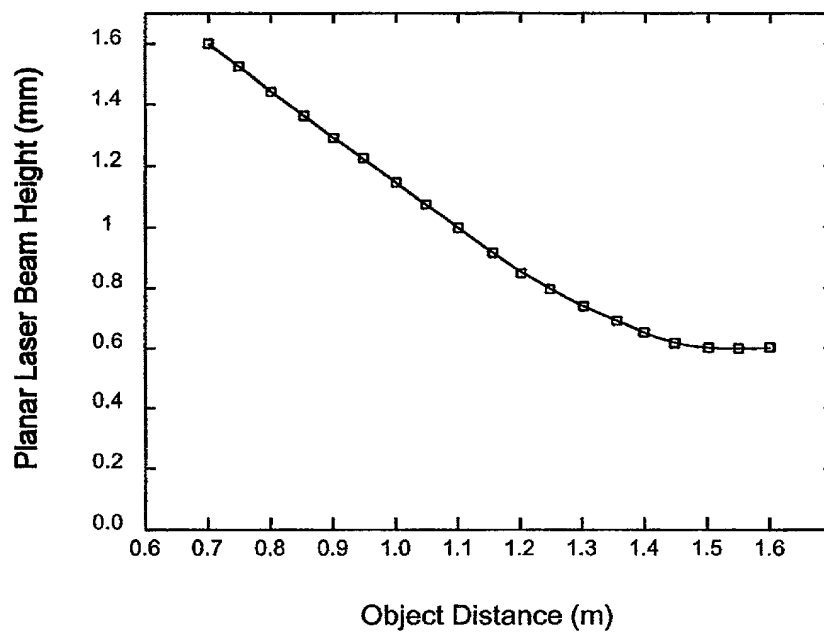


FIG. 1M4



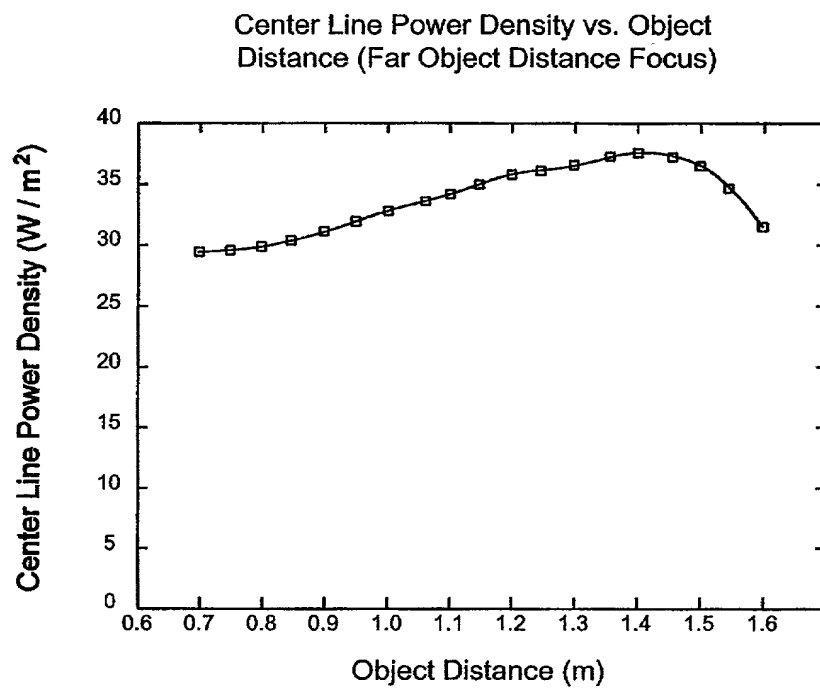


FIG. 1N

Pixel Power Densities vs. Object Distance

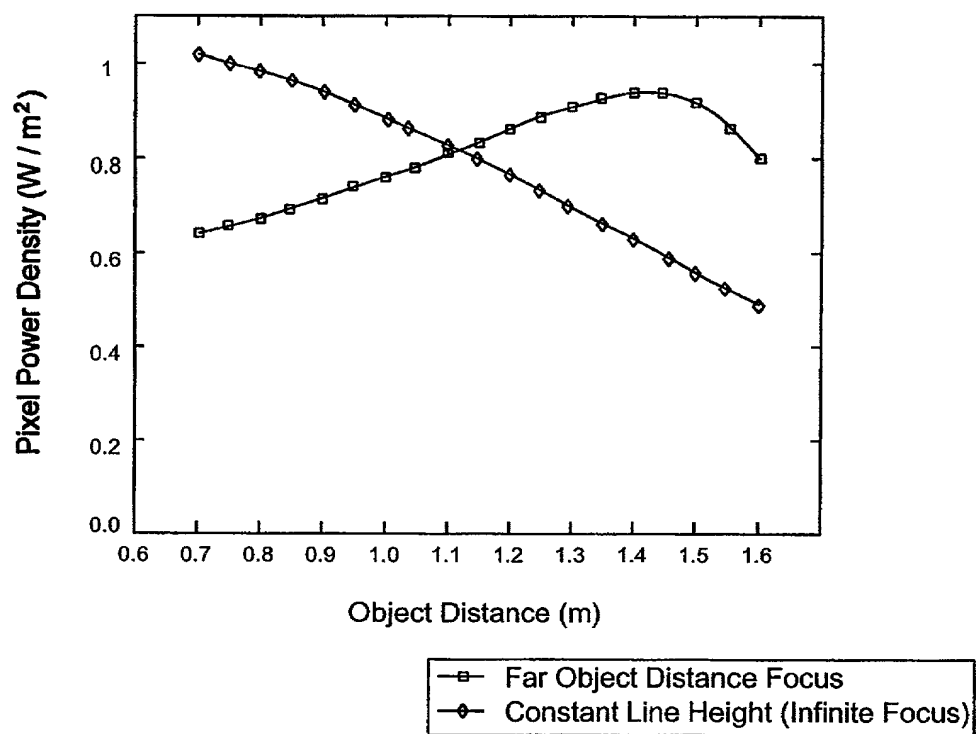


FIG. 10

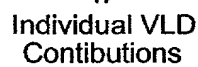


FIG. 1P1

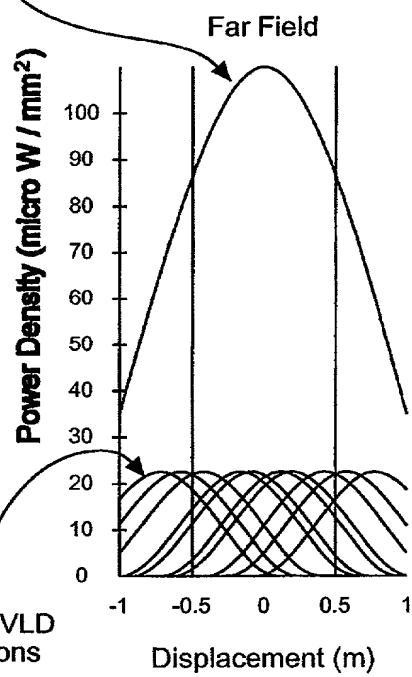


FIG. 1P2

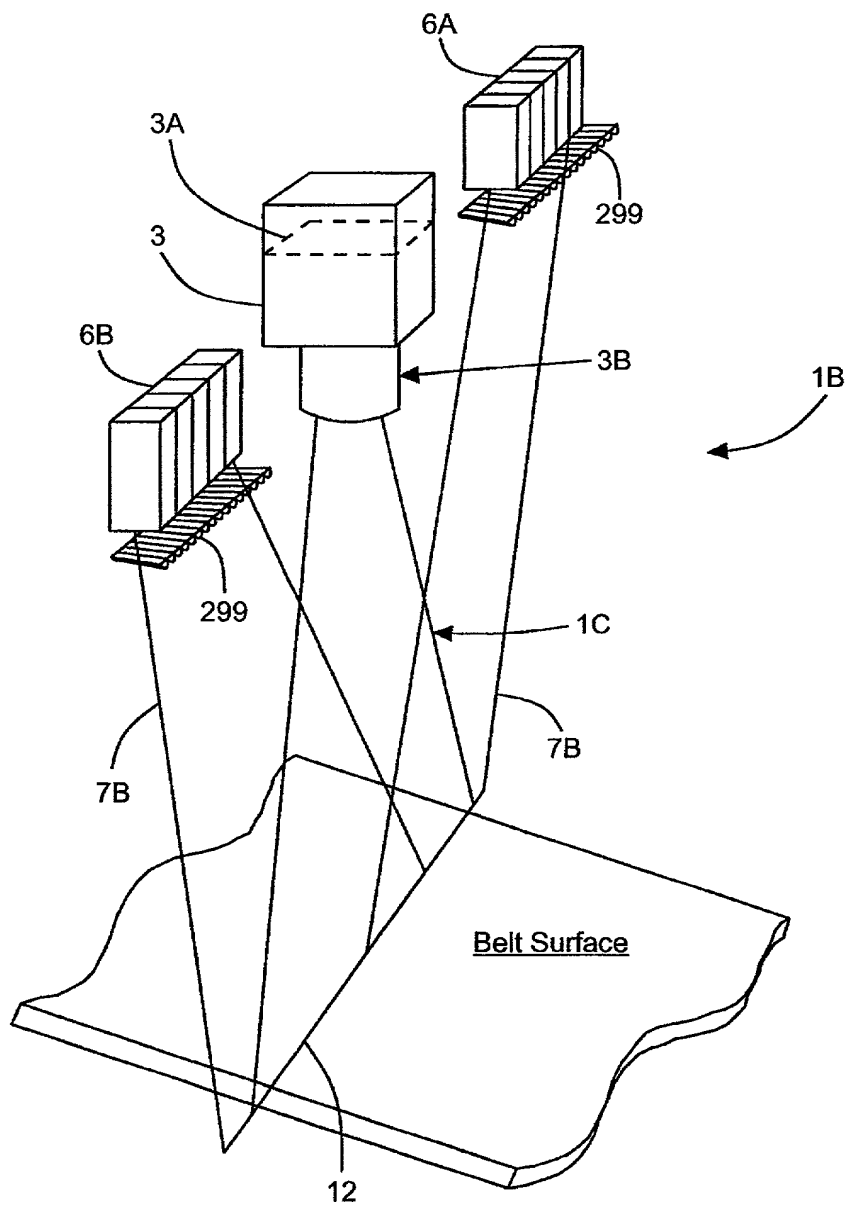


FIG. 1Q1



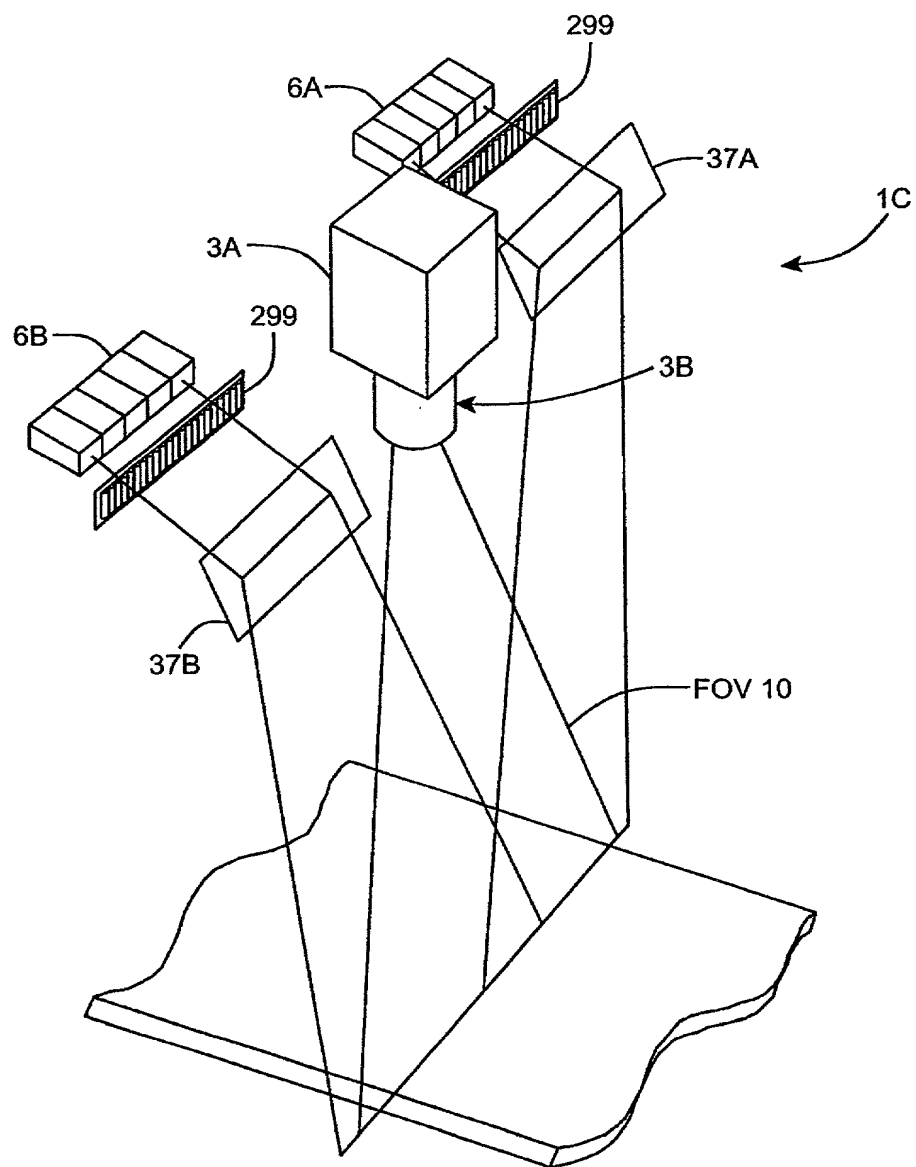


FIG. 1R1

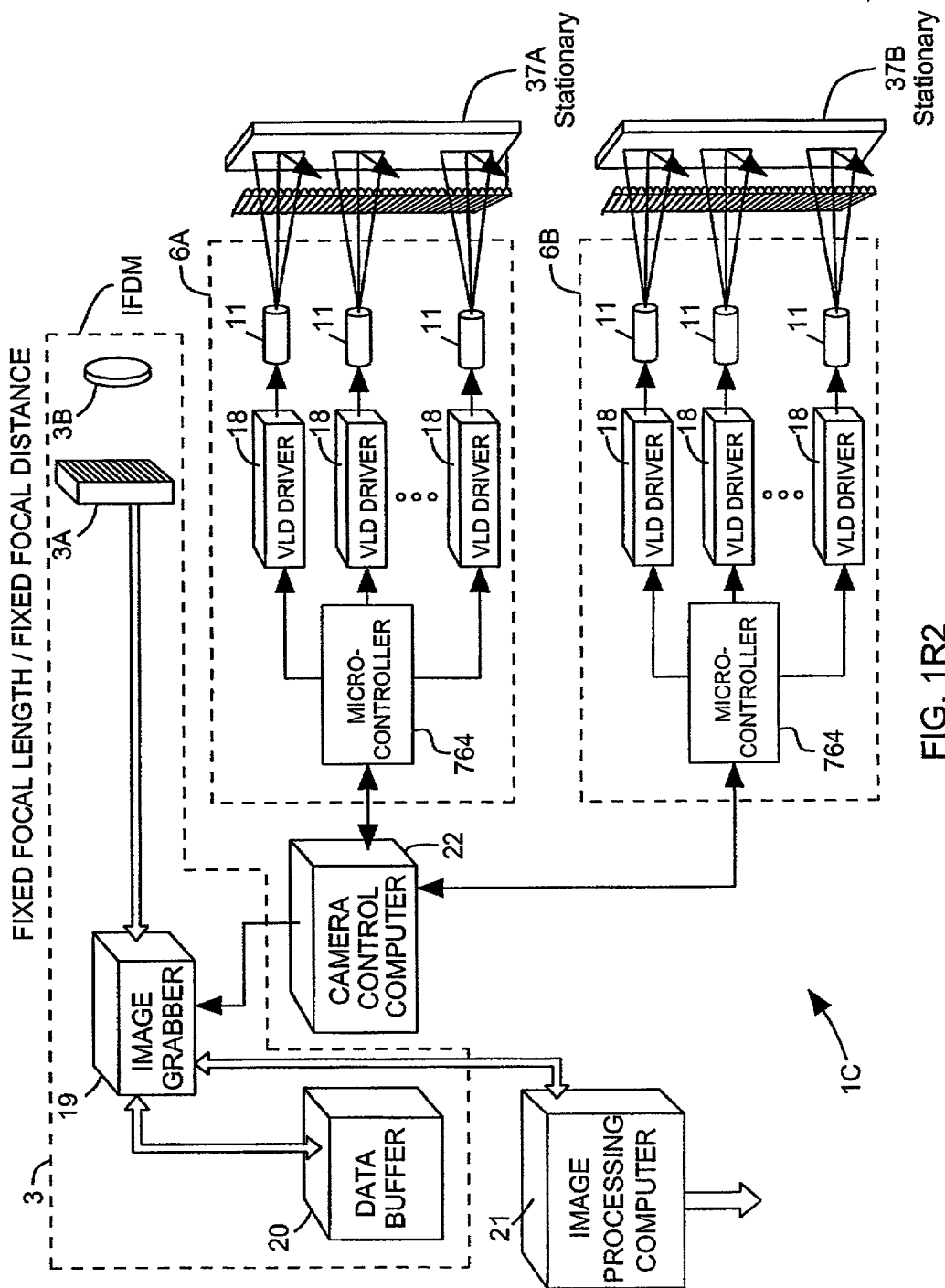


FIG. 1R2







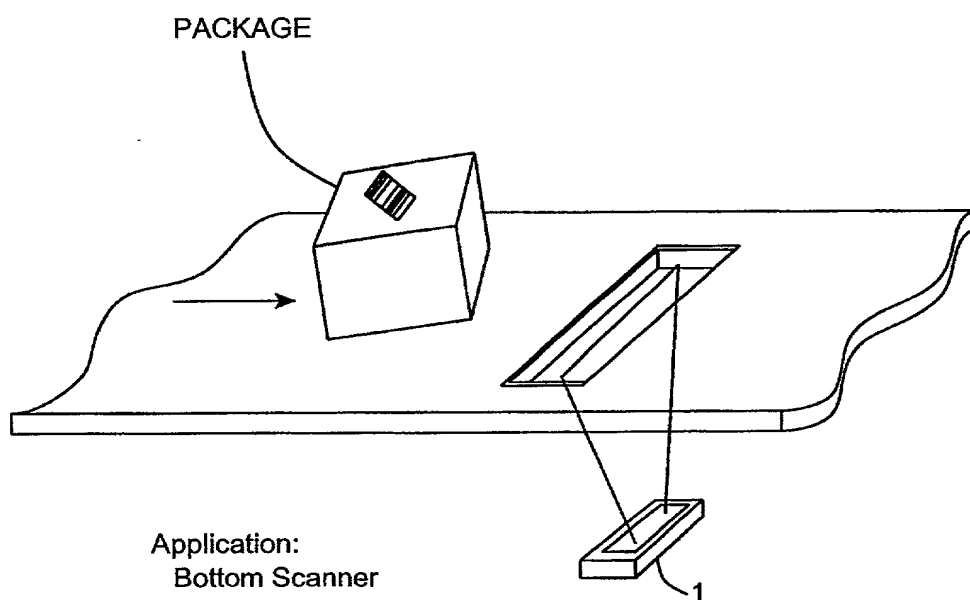


FIG. 1T

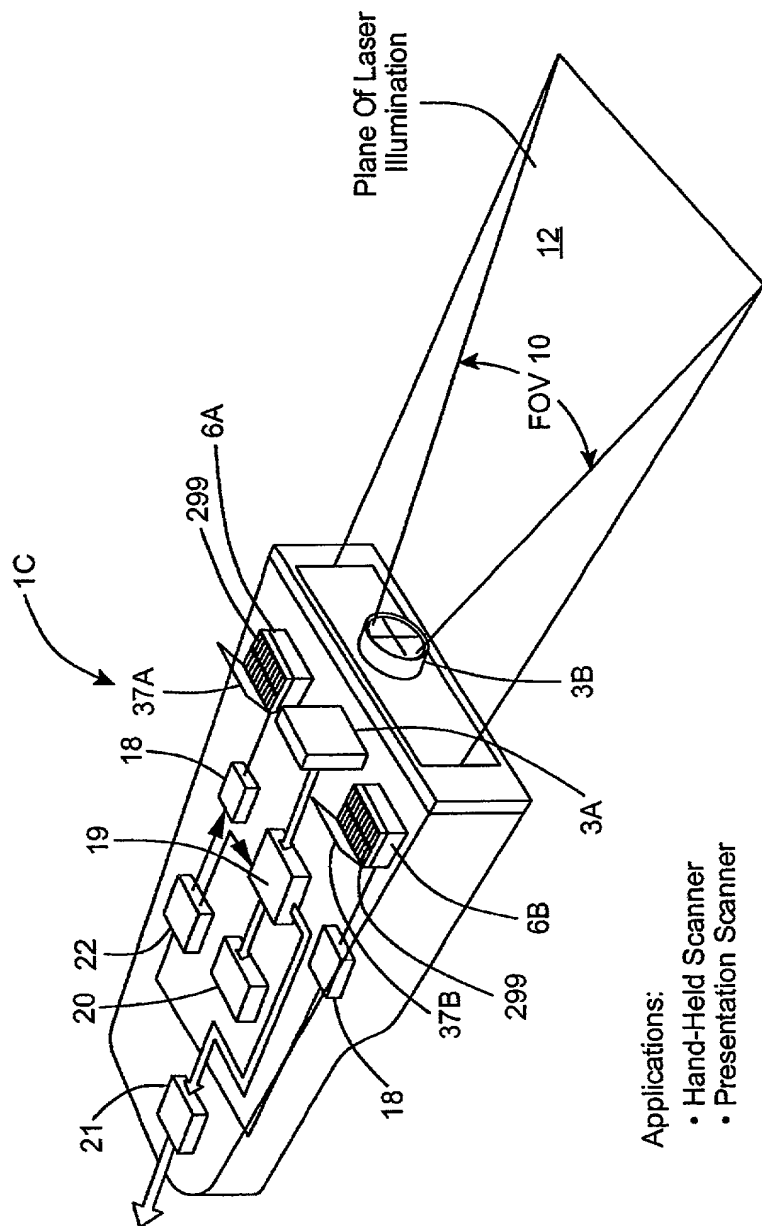


FIG. 1U

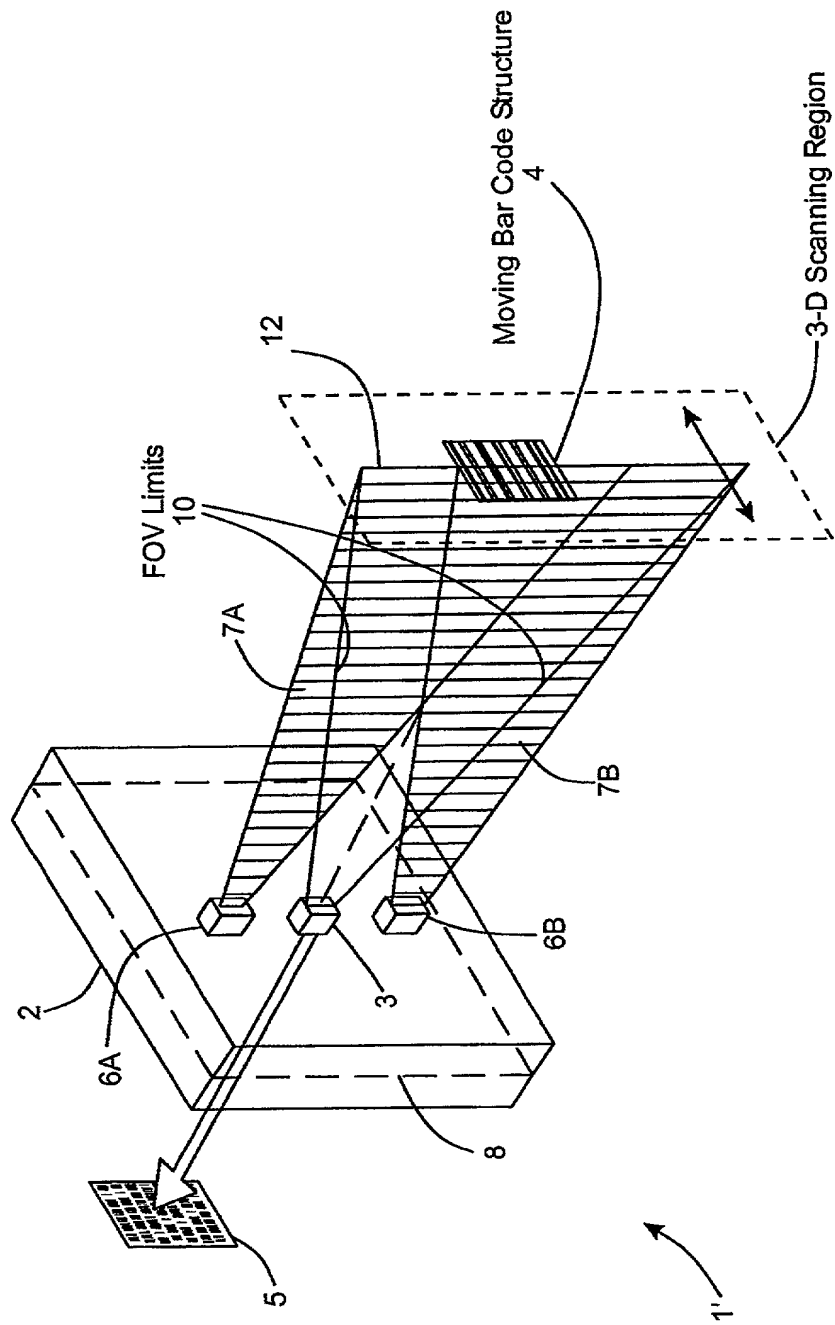


FIG. 1V1

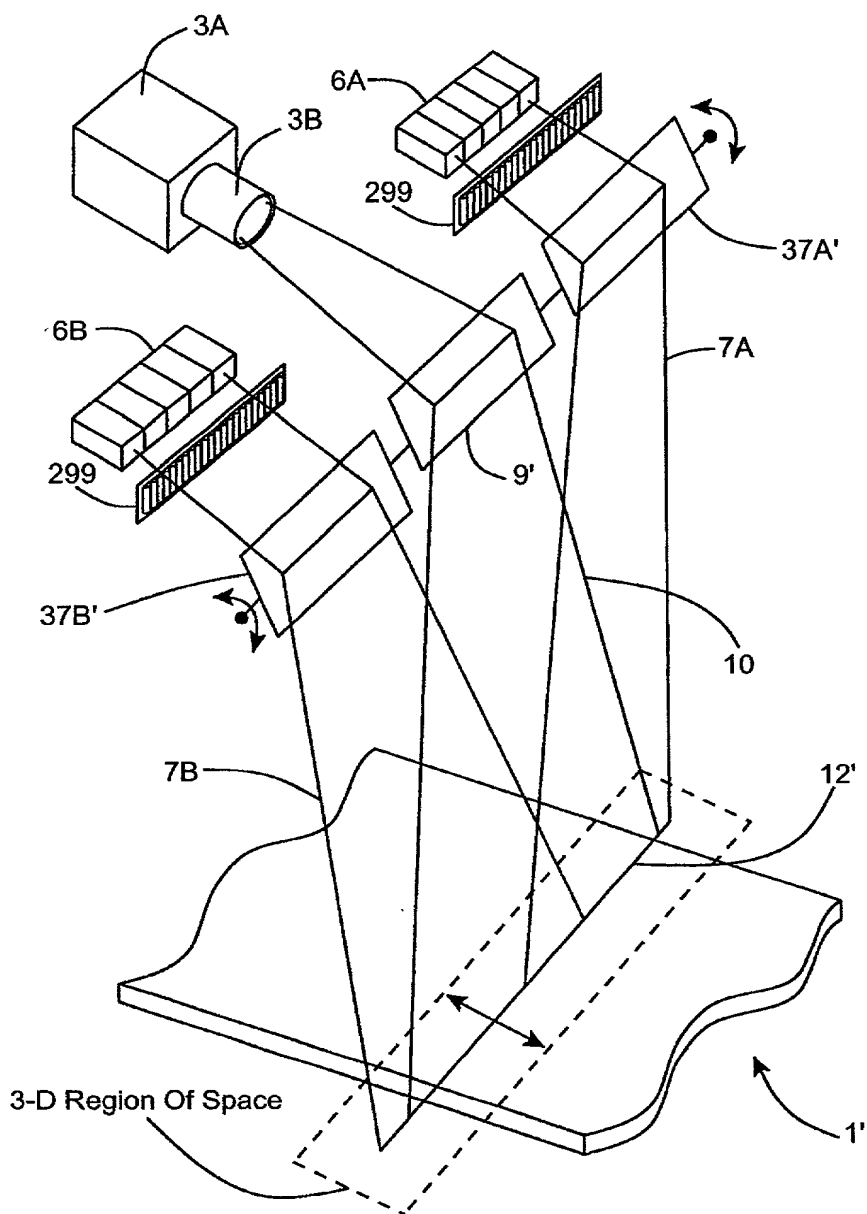


FIG. 1V2

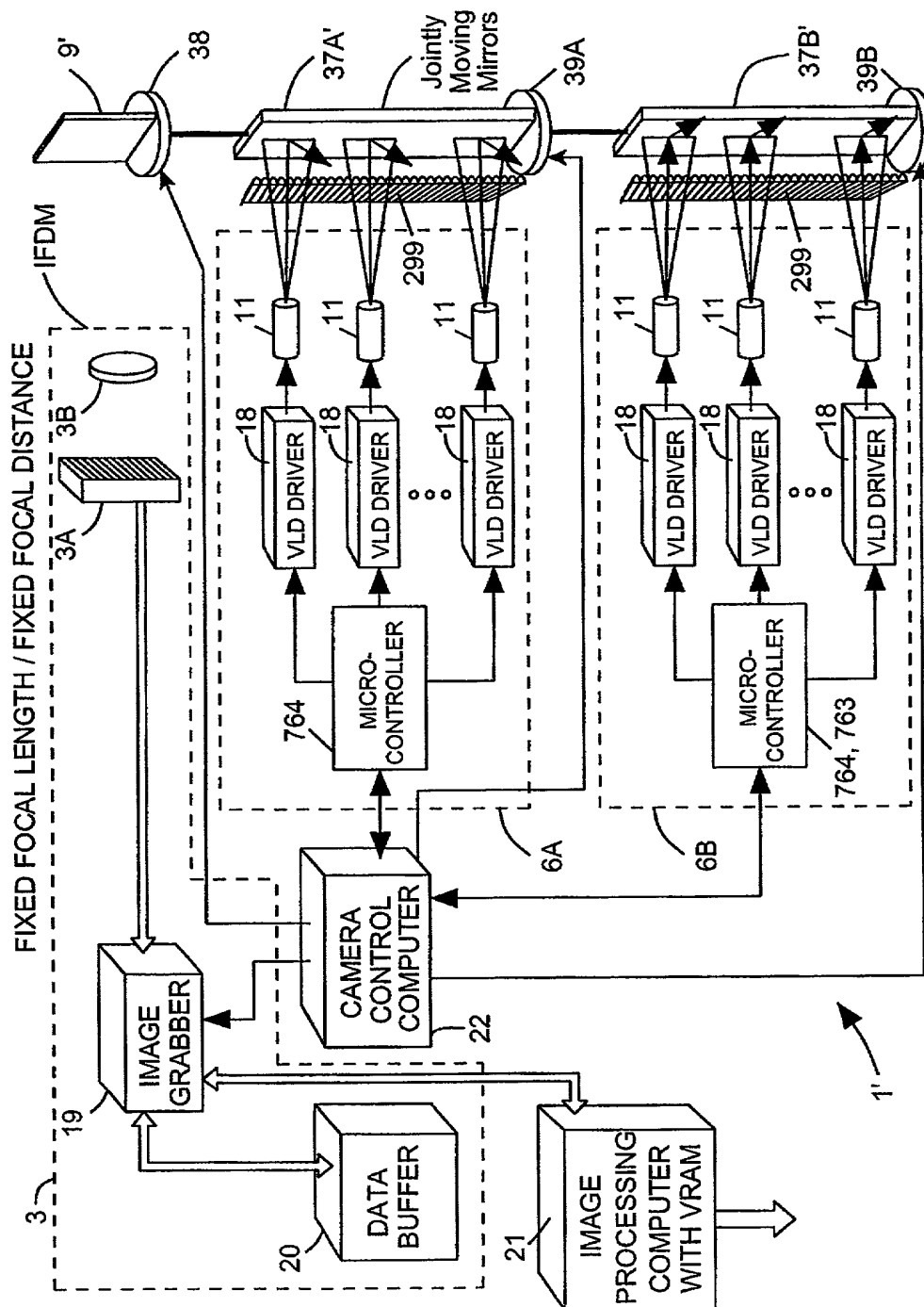
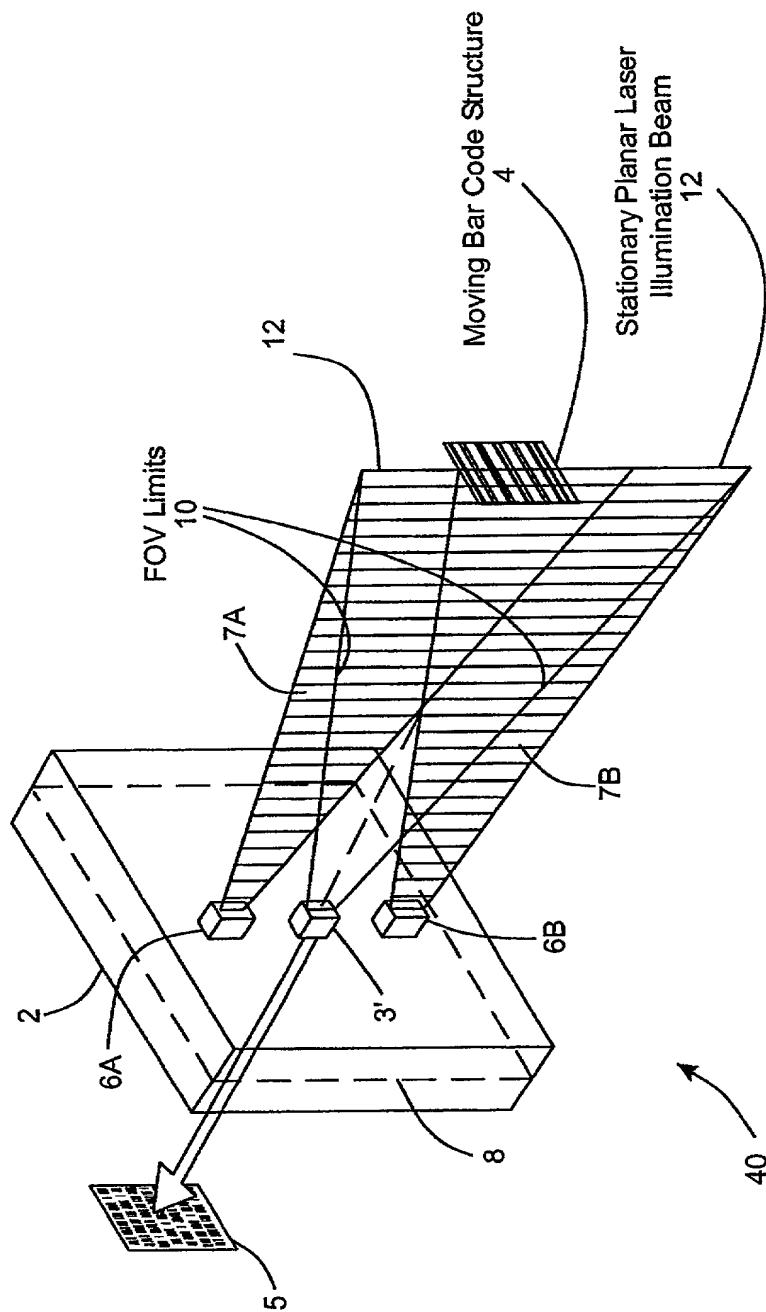
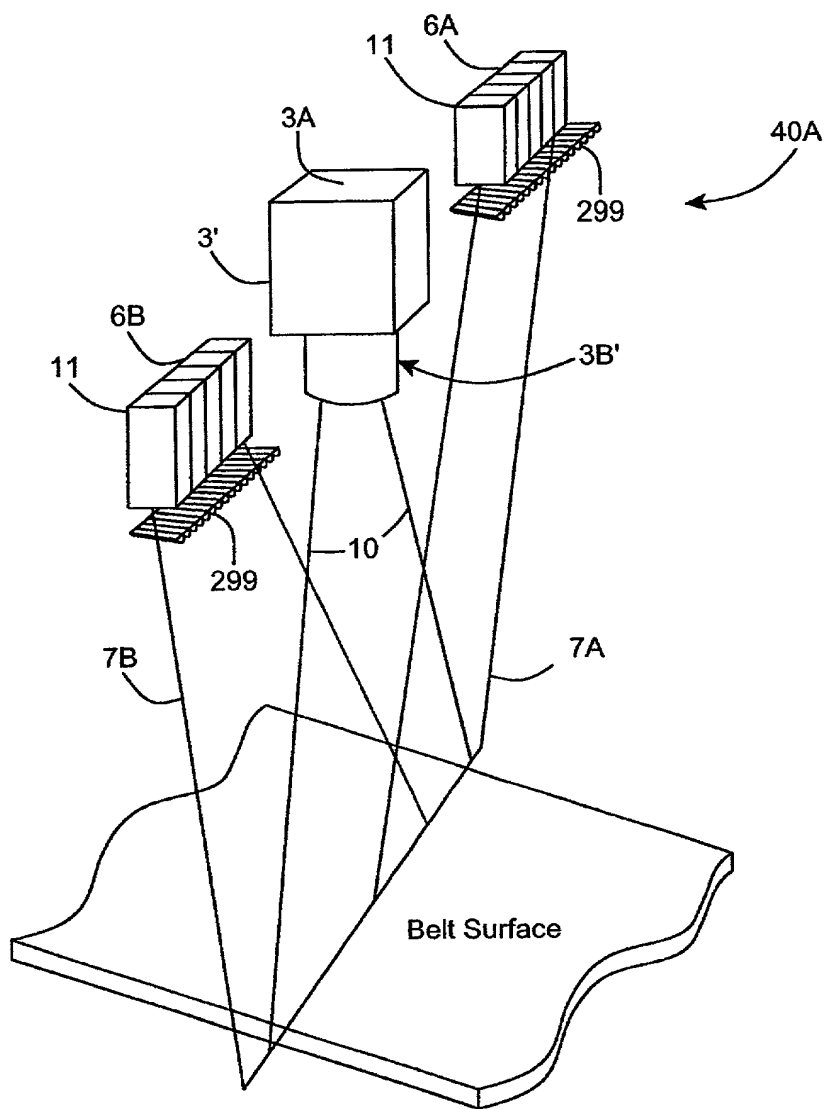


FIG. 1V3









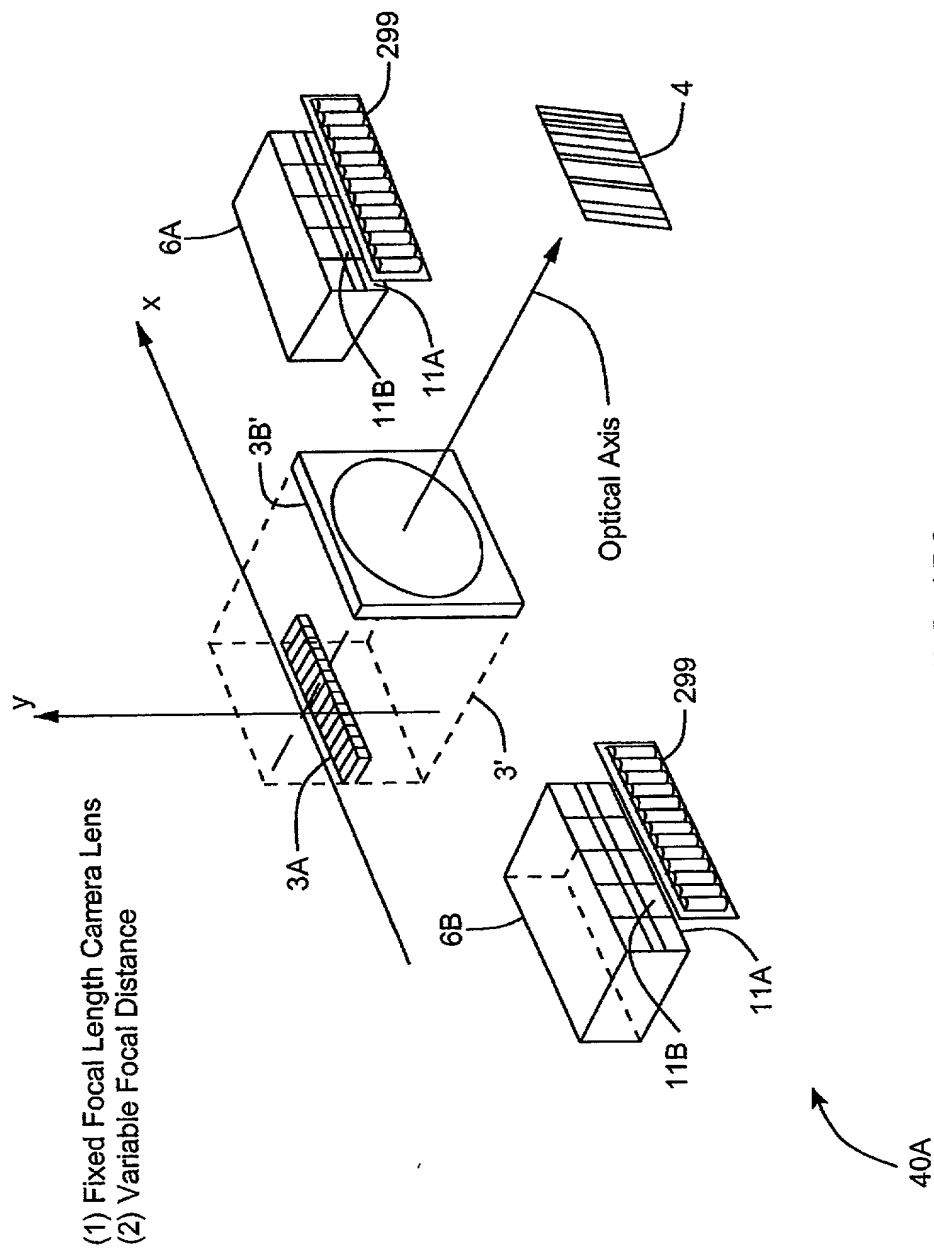


FIG. 2B2

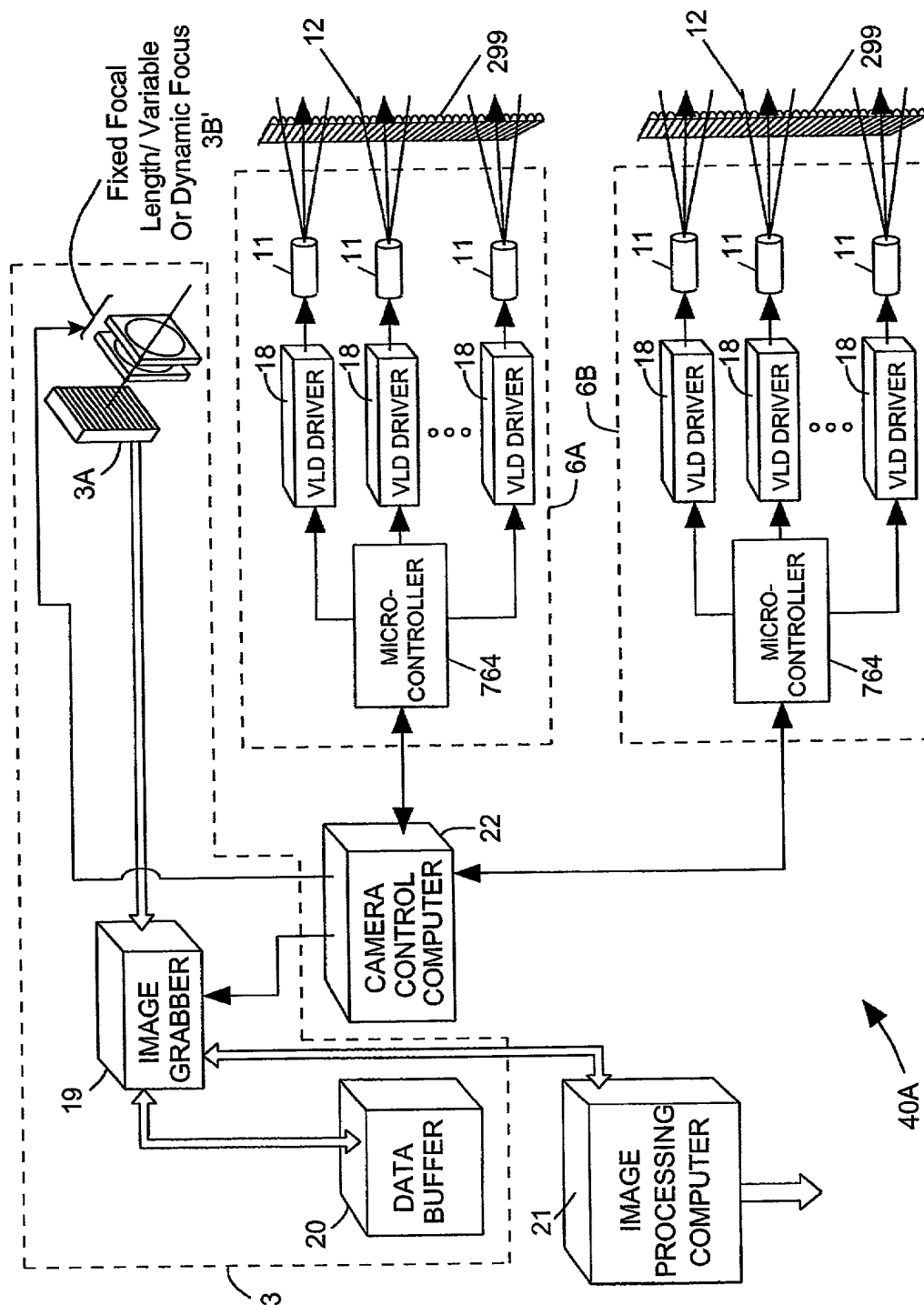


FIG. 2C1

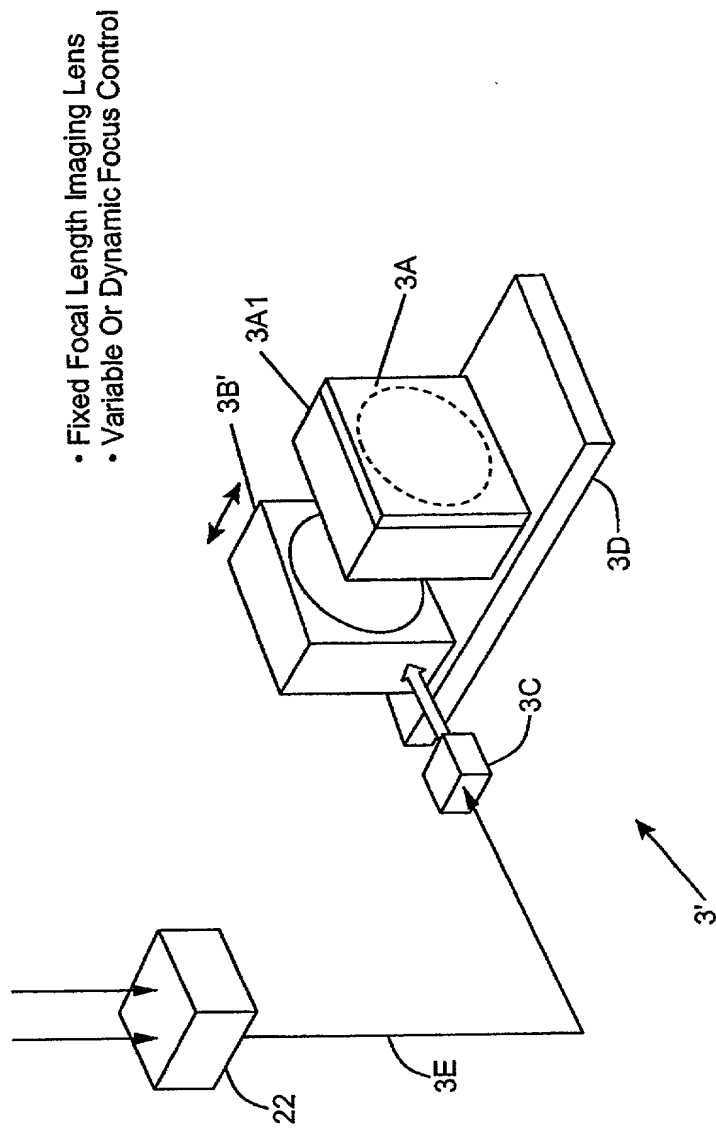


FIG. 2C2

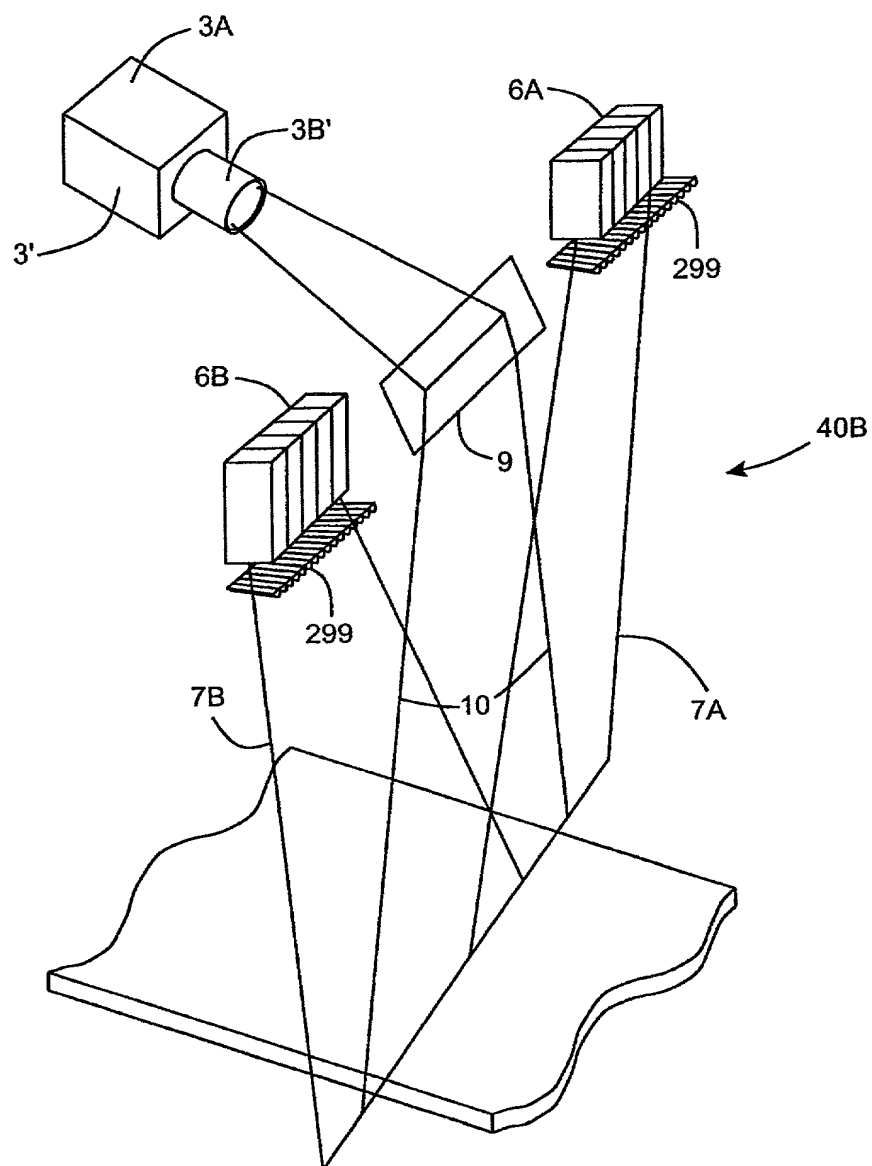


FIG. 2D1

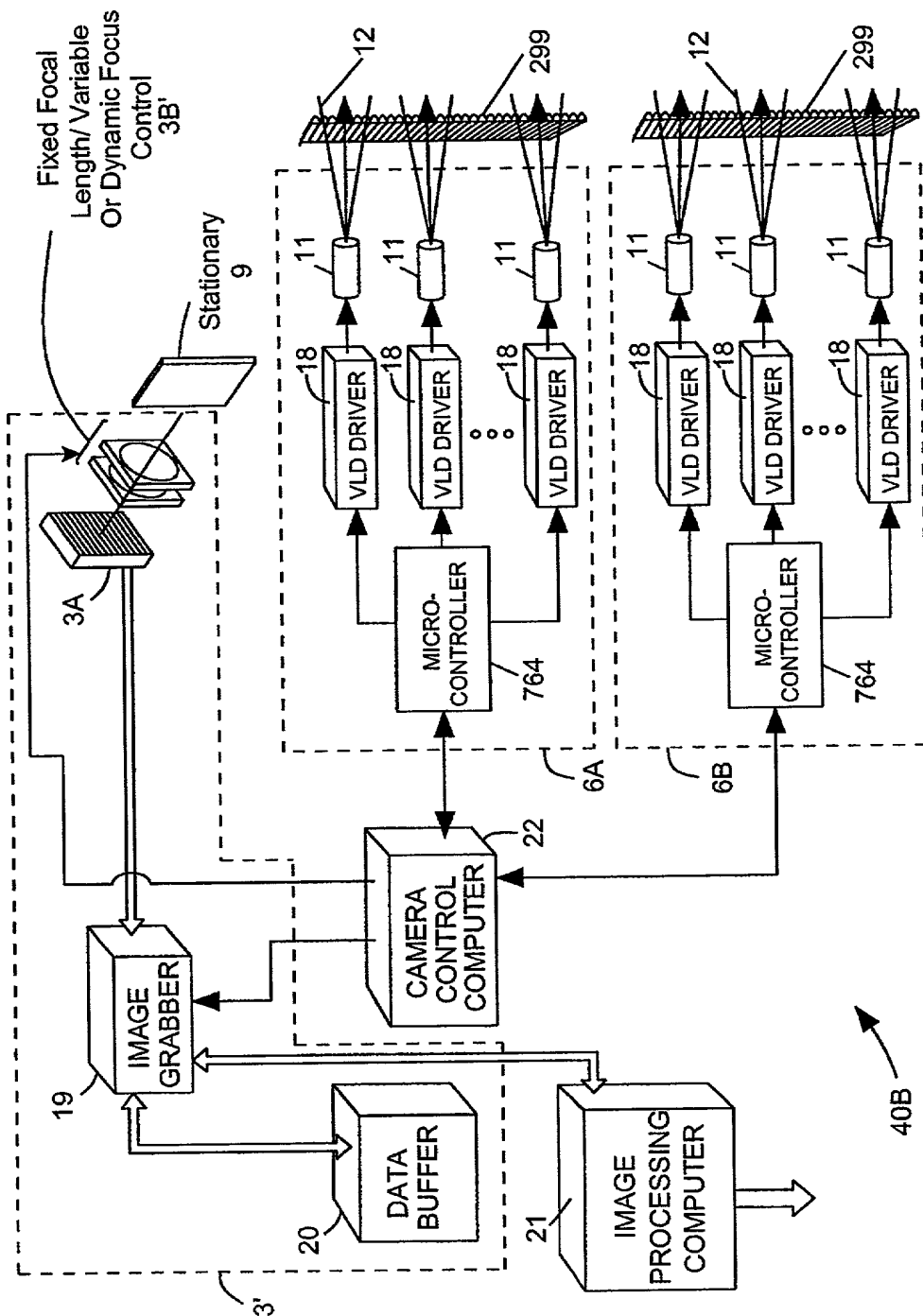


FIG. 2D2

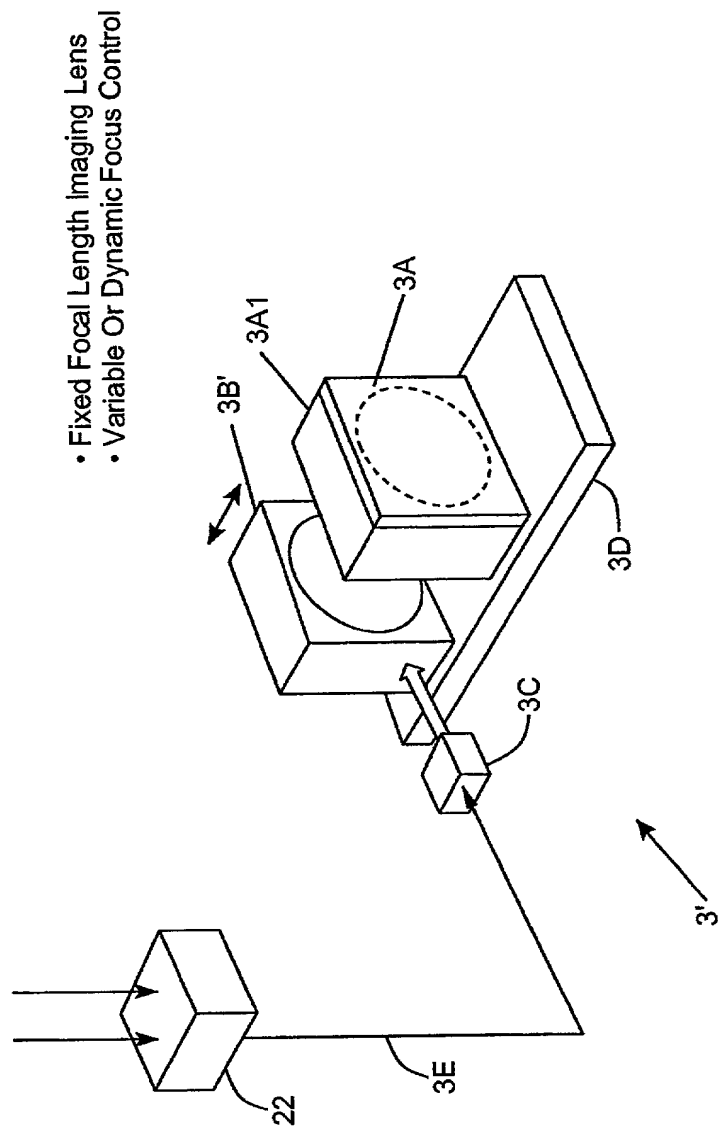
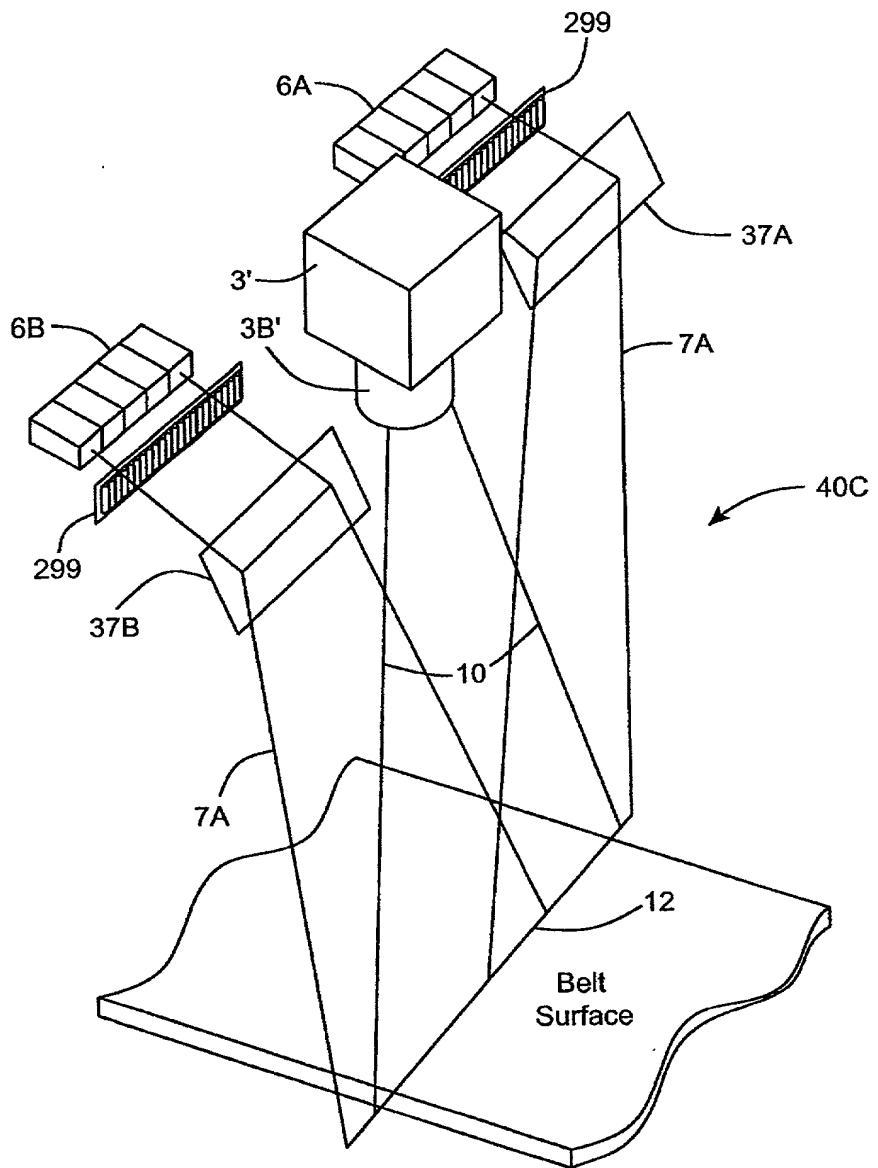


FIG. 2D3

20060207 04529001





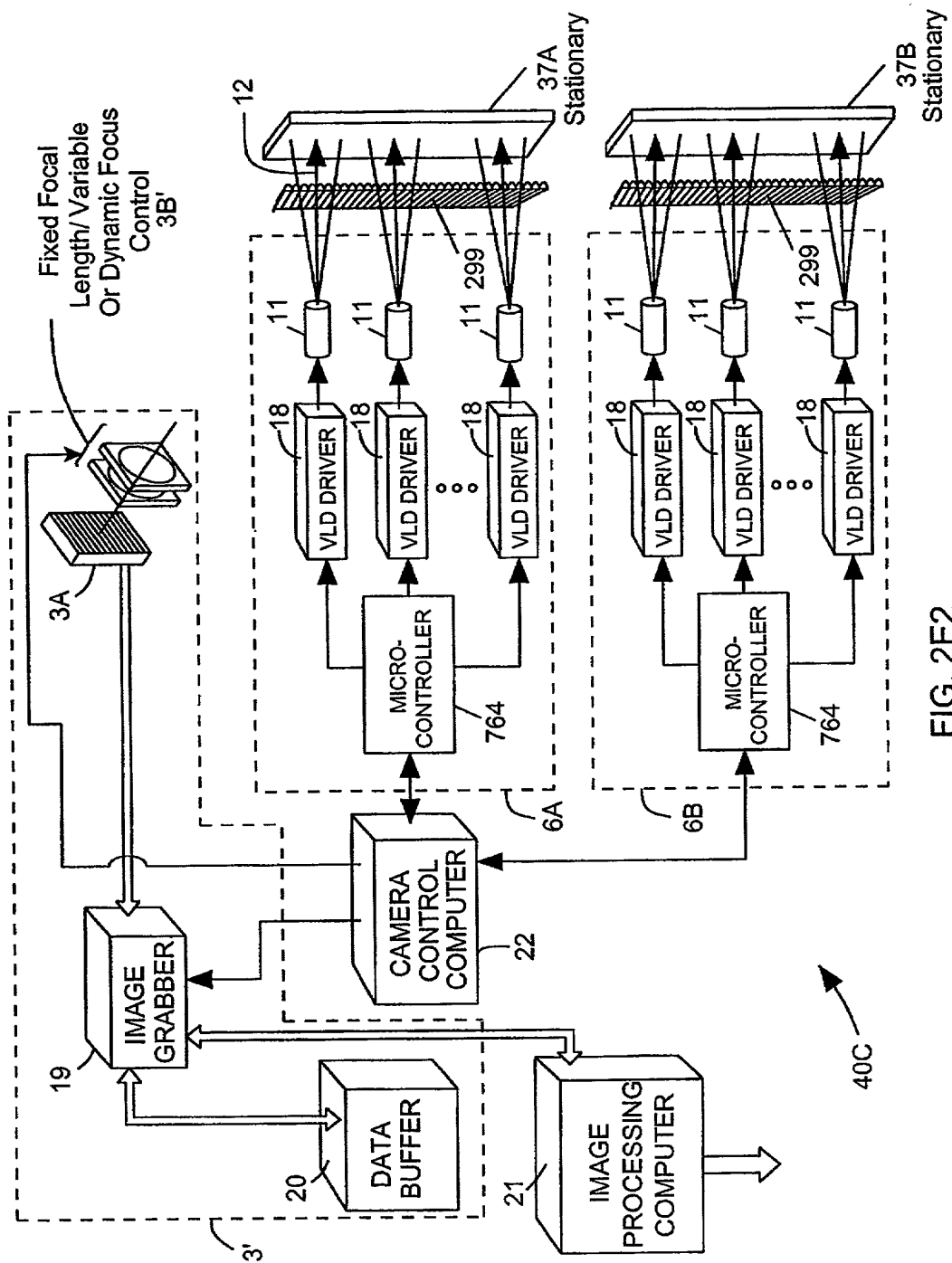


FIG. 2E2

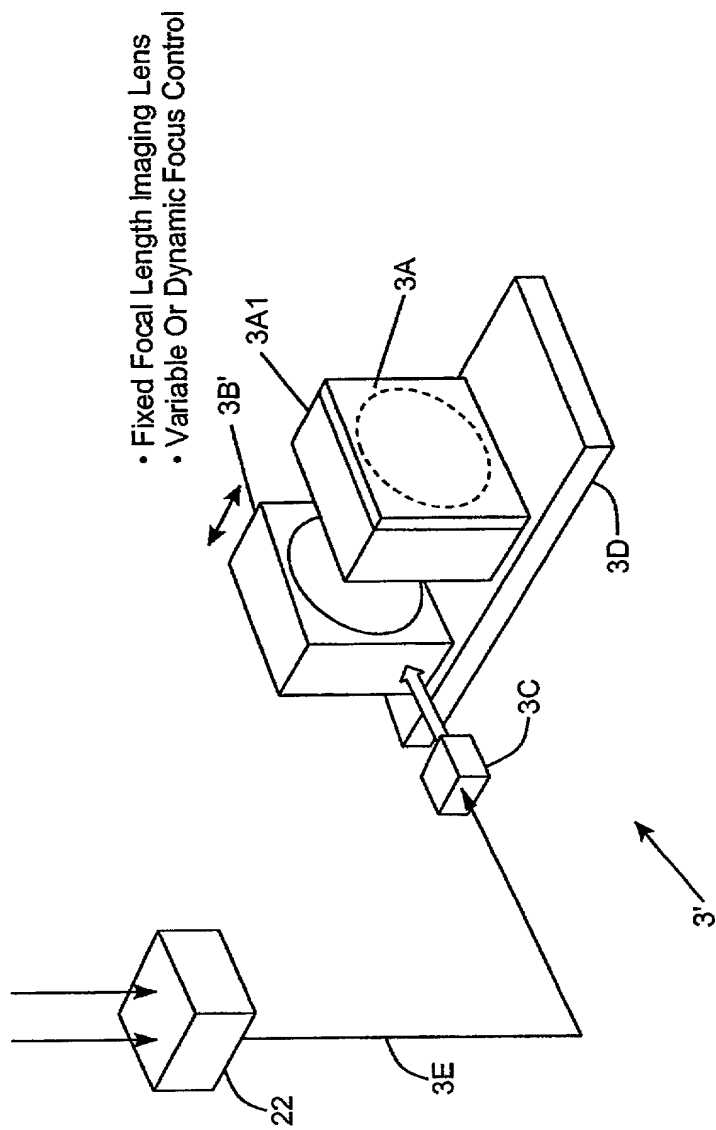
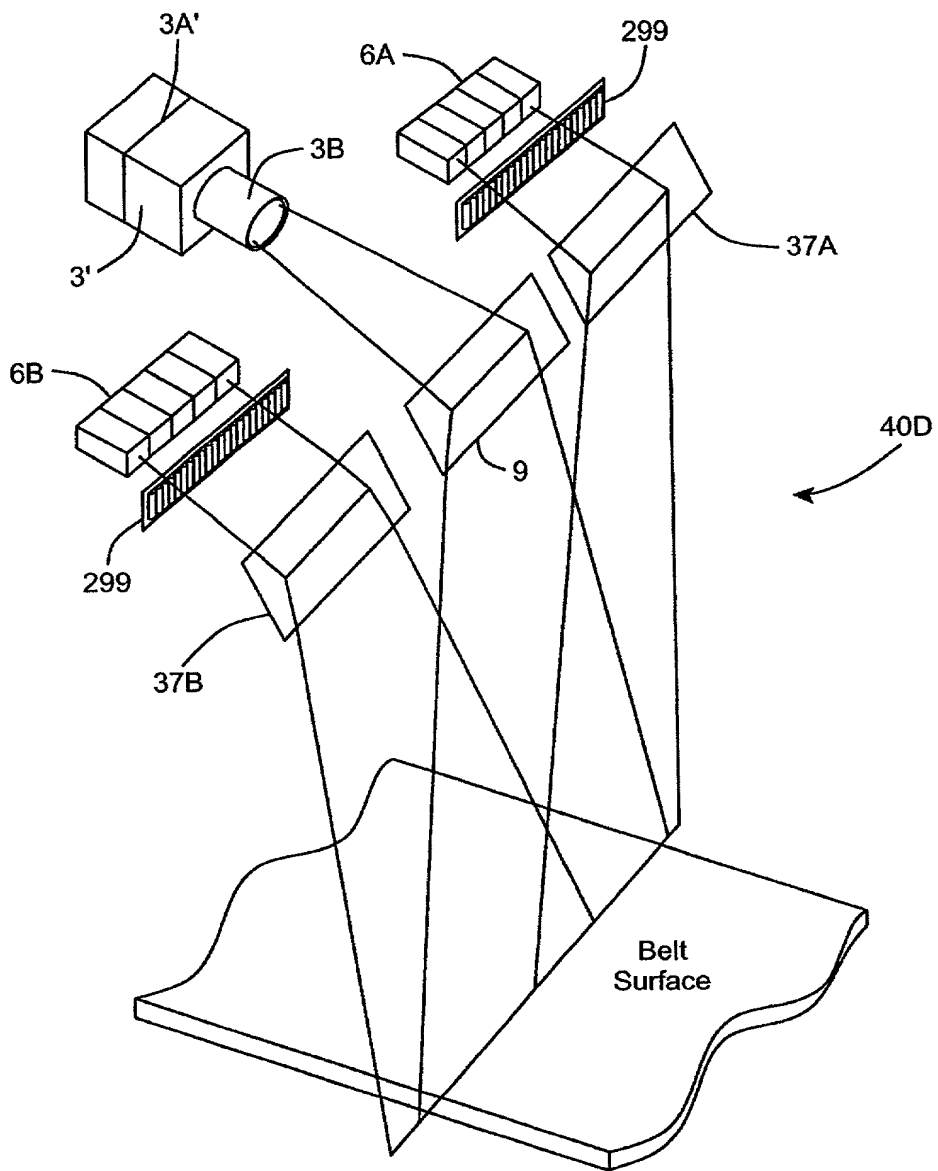


FIG. 2E3





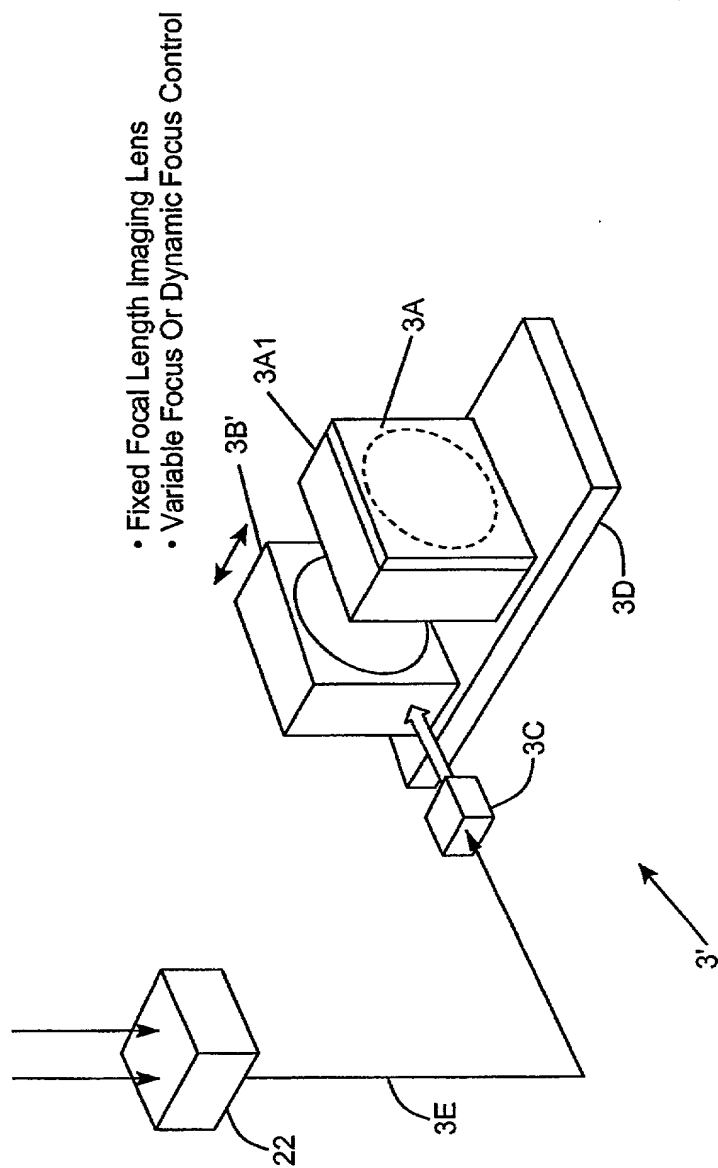


FIG. 2F3

Top Conveyor Scanner:

- Fixed Focal Length Imaging Lens
- Variable Focal Distance Control

Side Conveyor Scanner:

- Fixed Focal Length Imaging Lens
- Dynamic Focal Distance Control

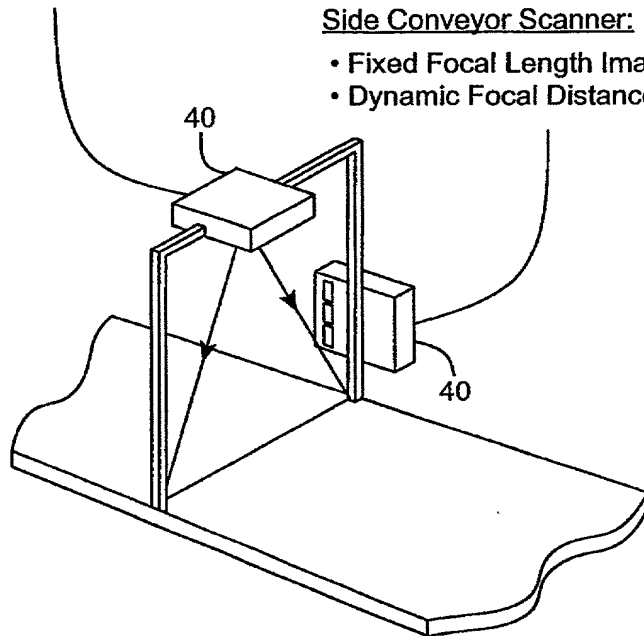


FIG. 2G

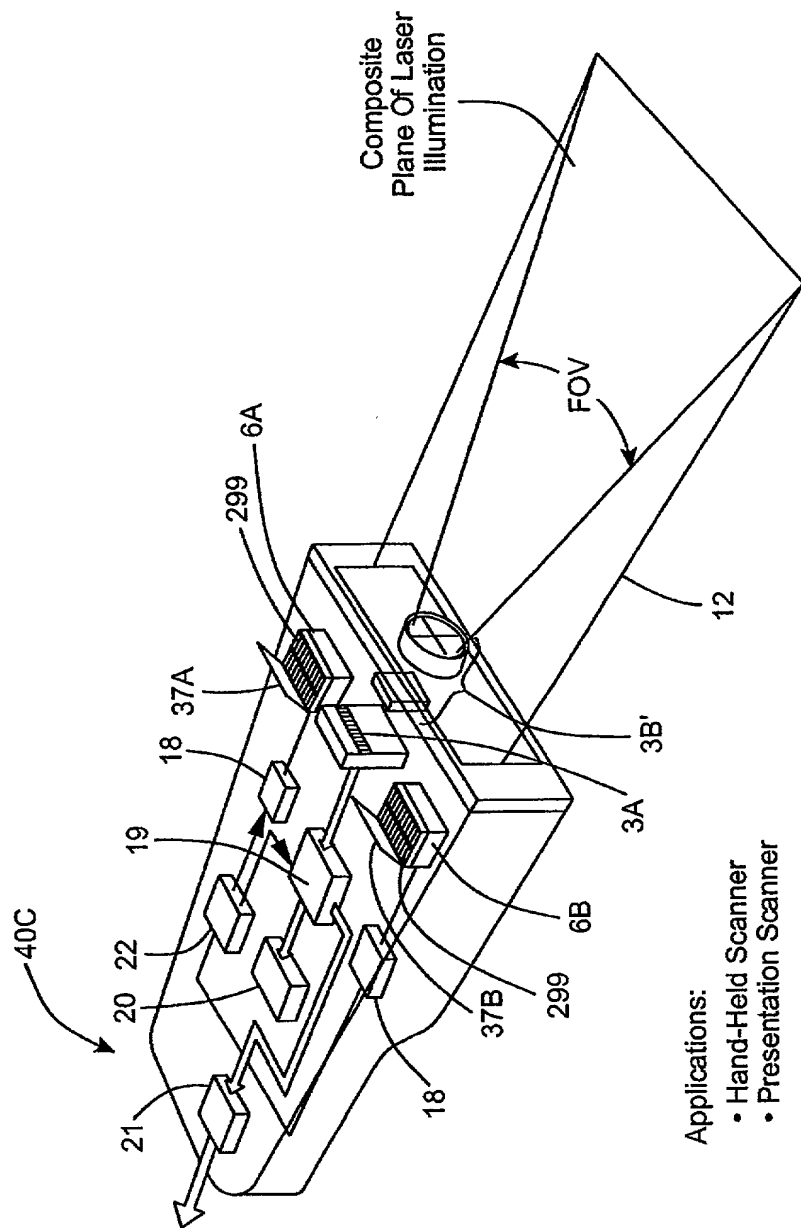
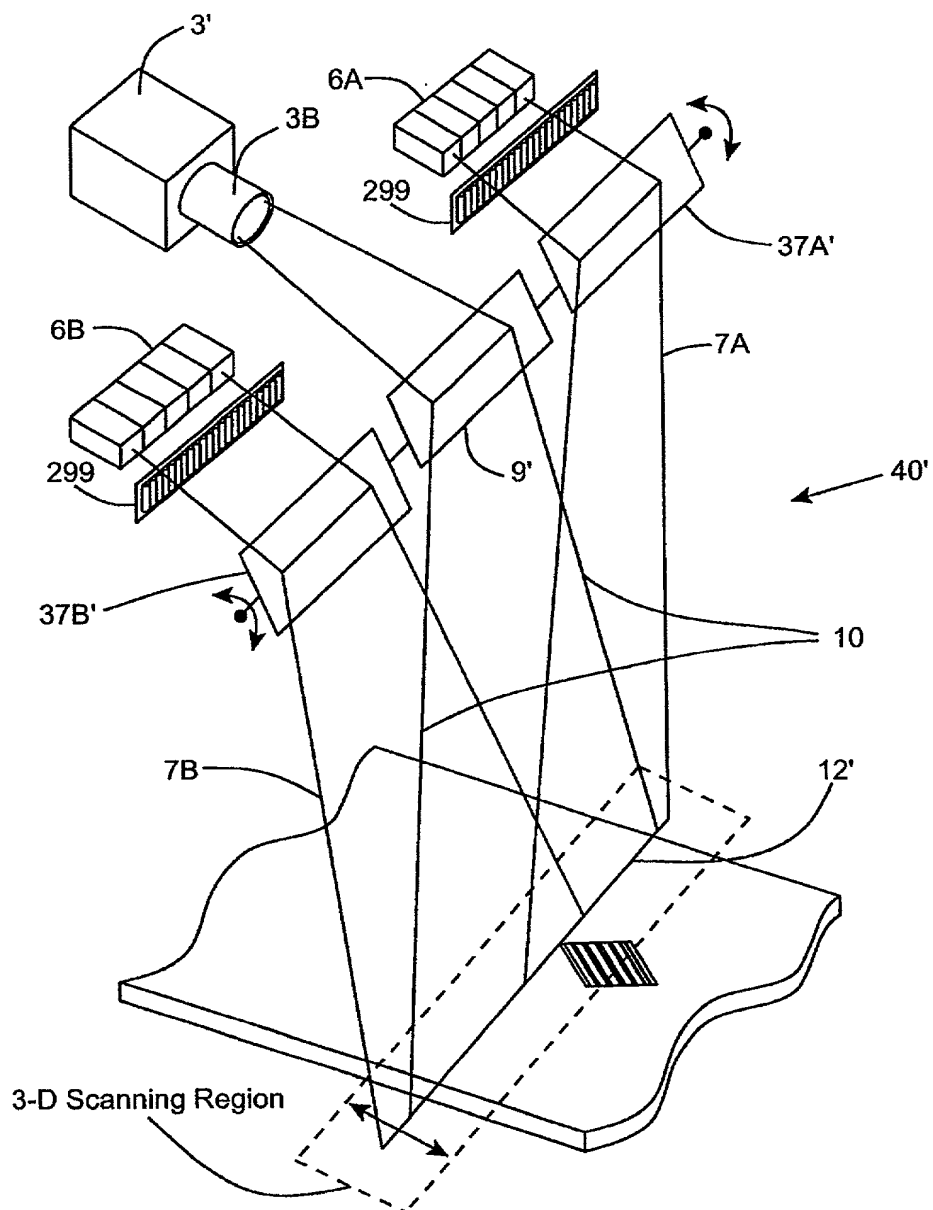


FIG. 2H







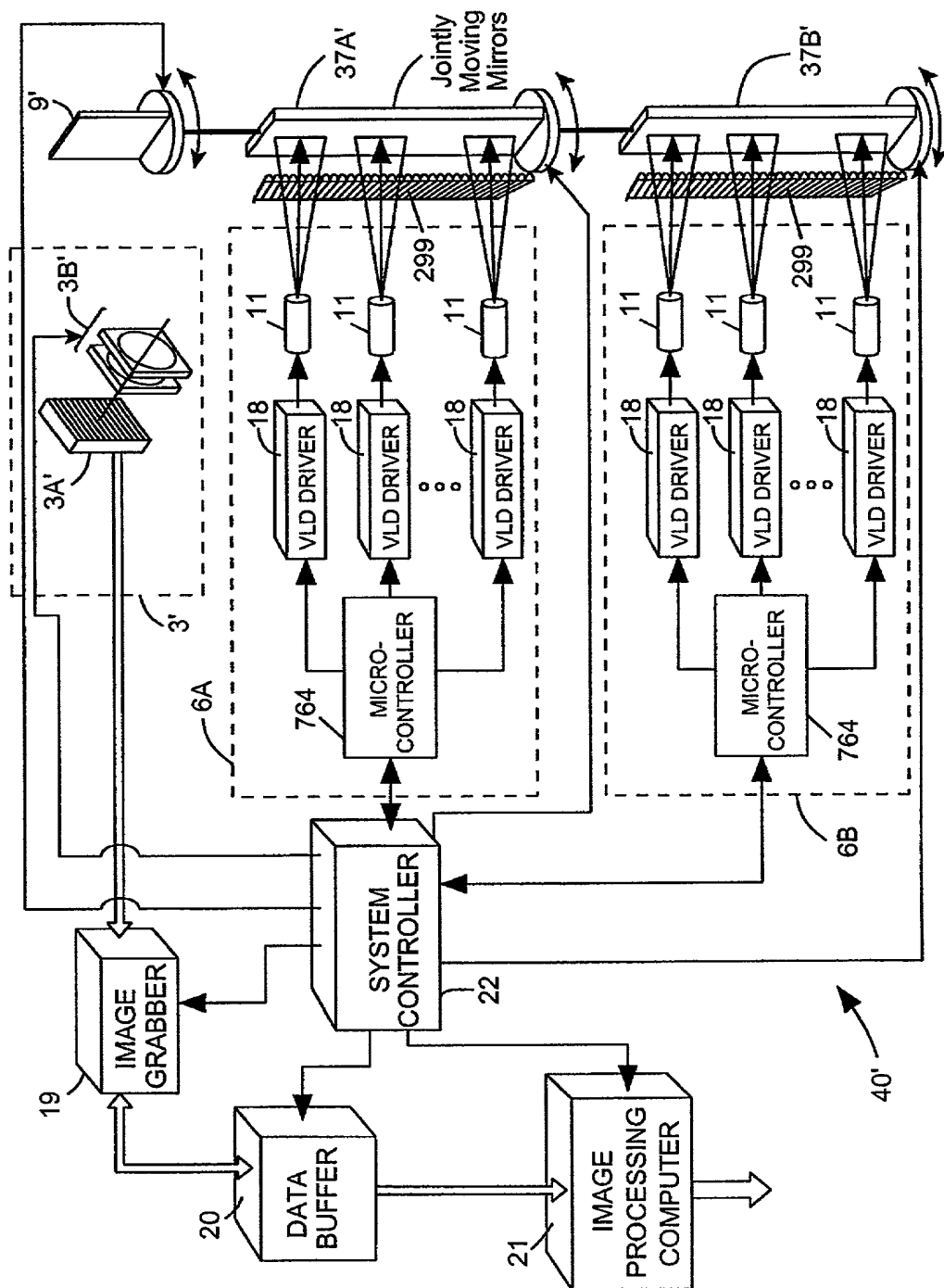


FIG. 213

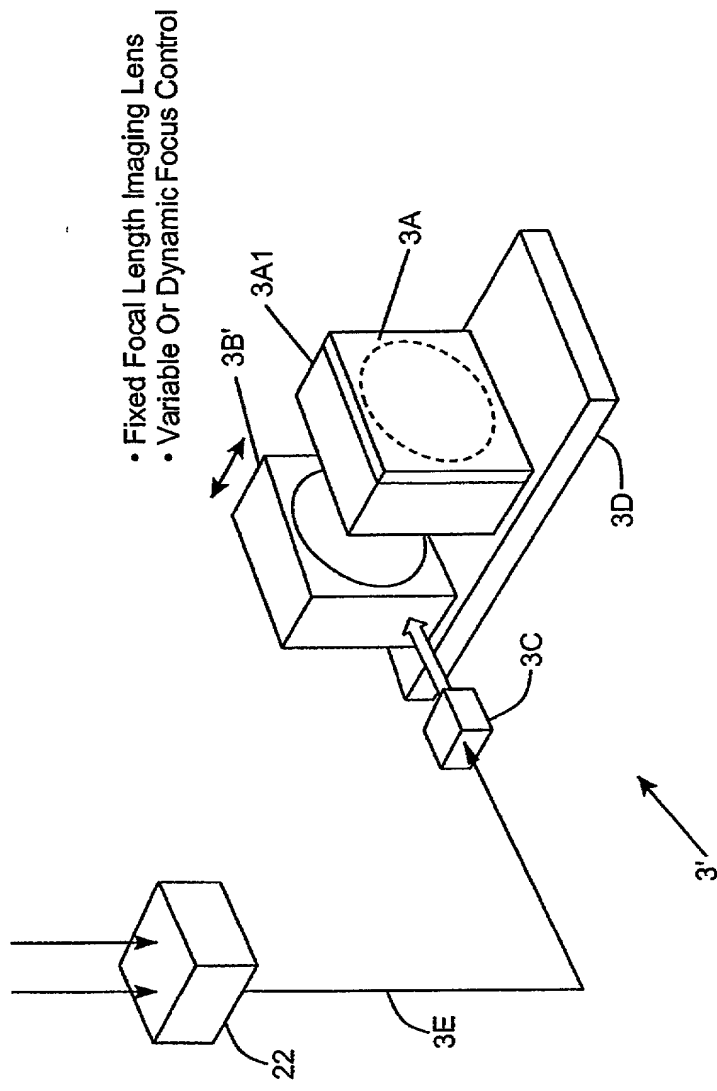


FIG. 214

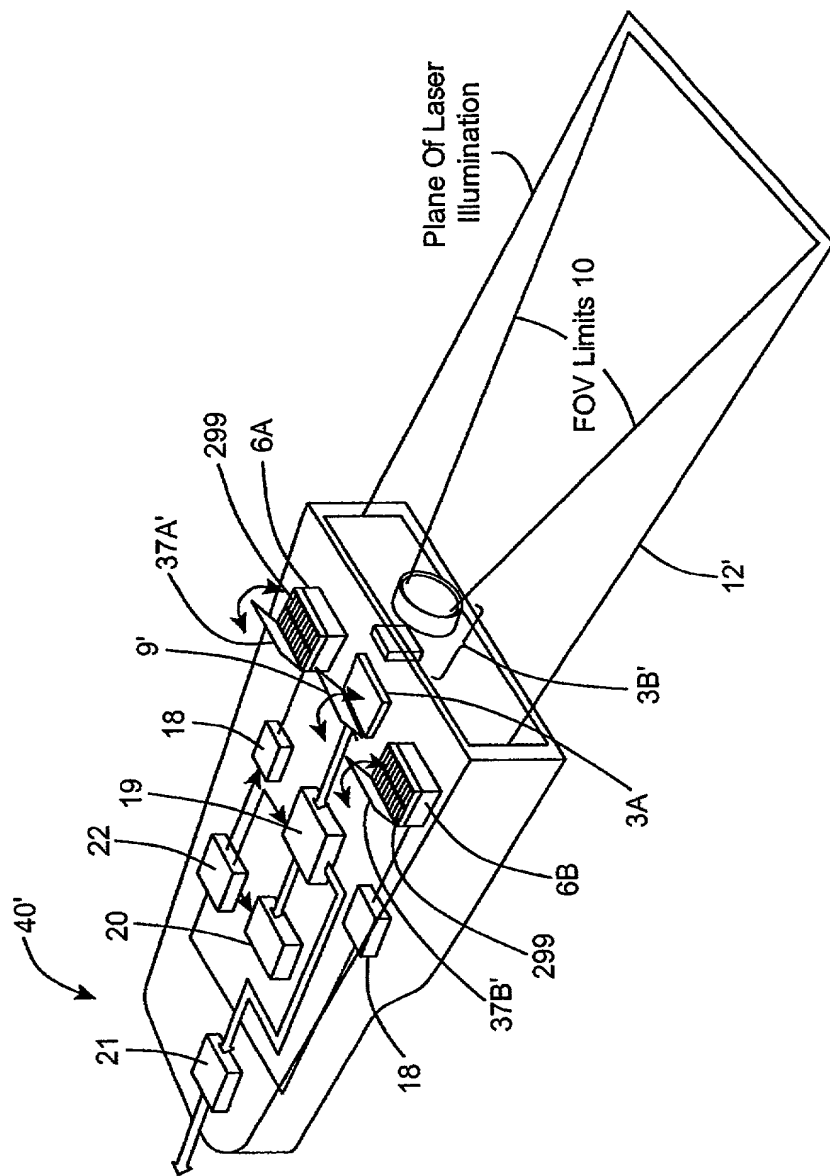


FIG. 215

600400429001

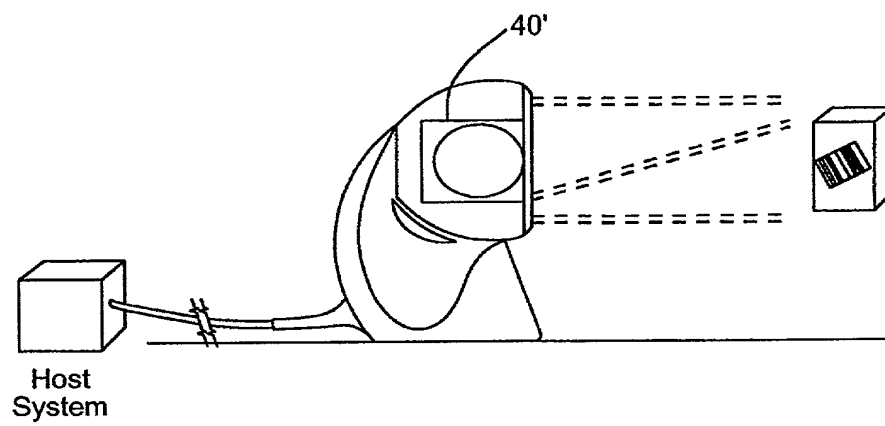


FIG. 216

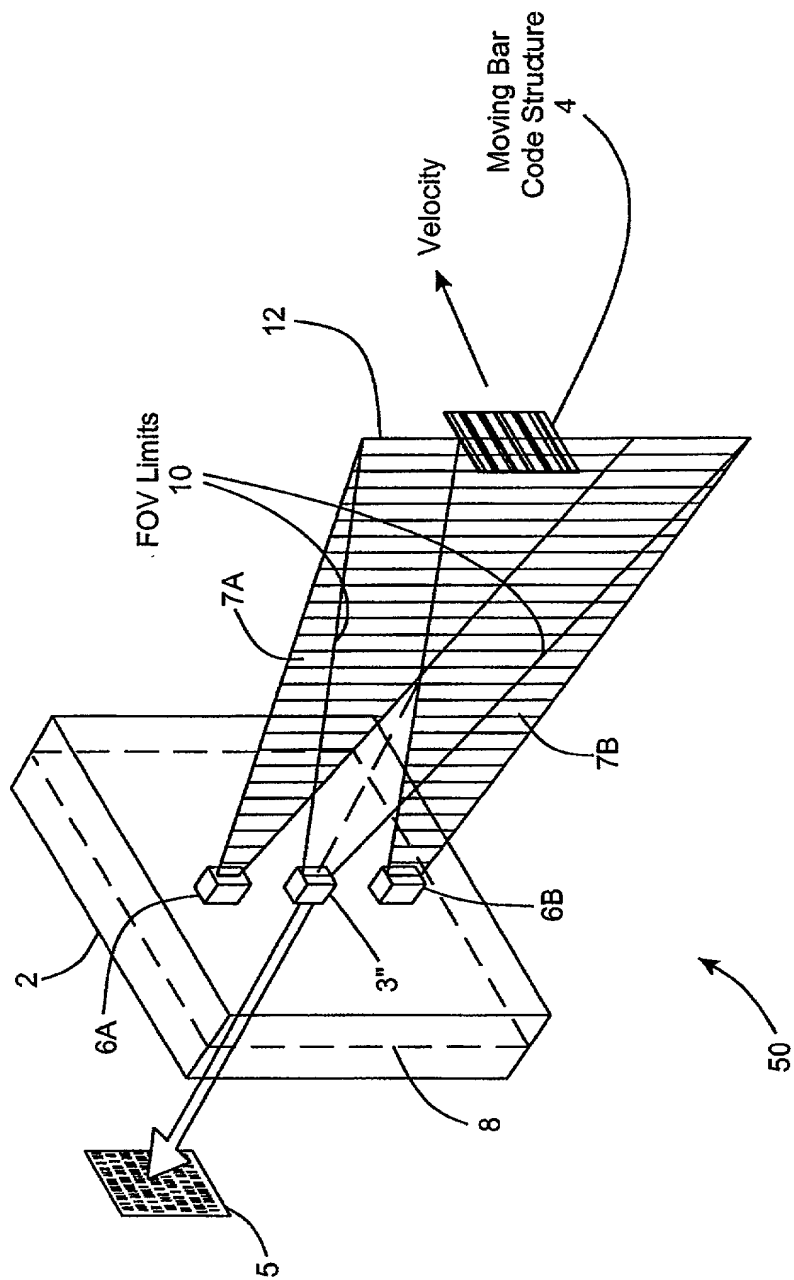


FIG. 3A

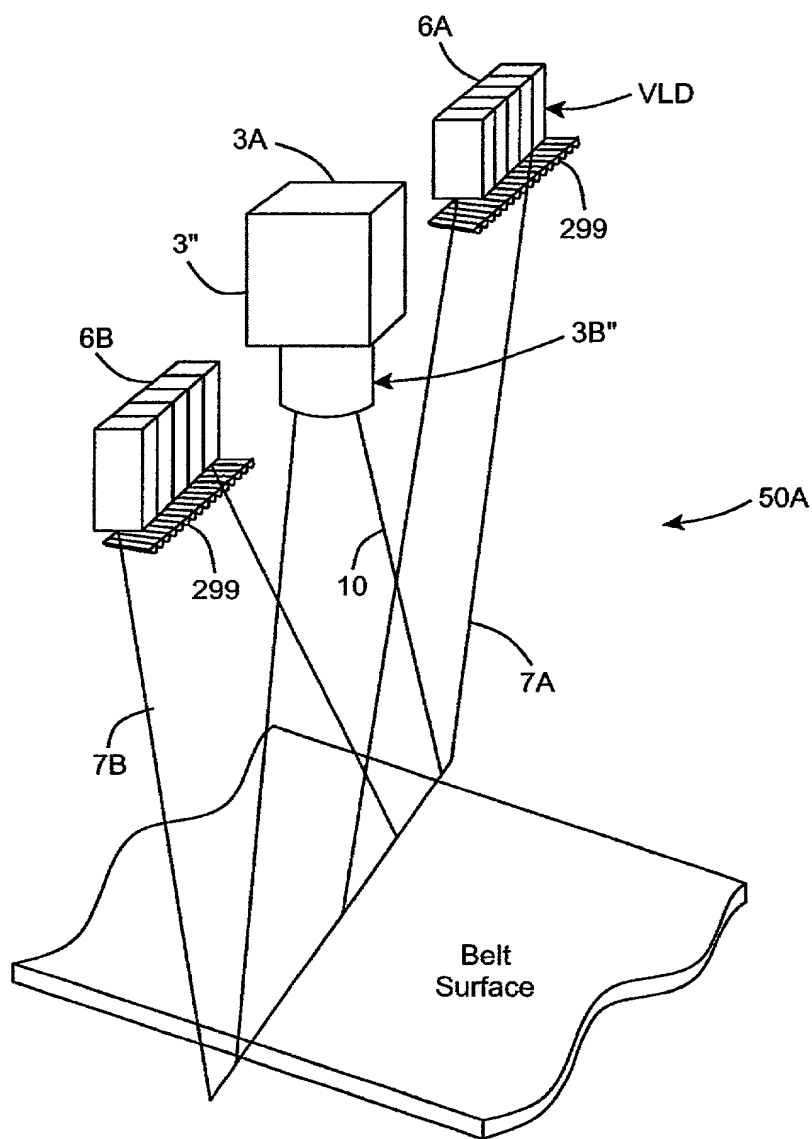


FIG. 3B1

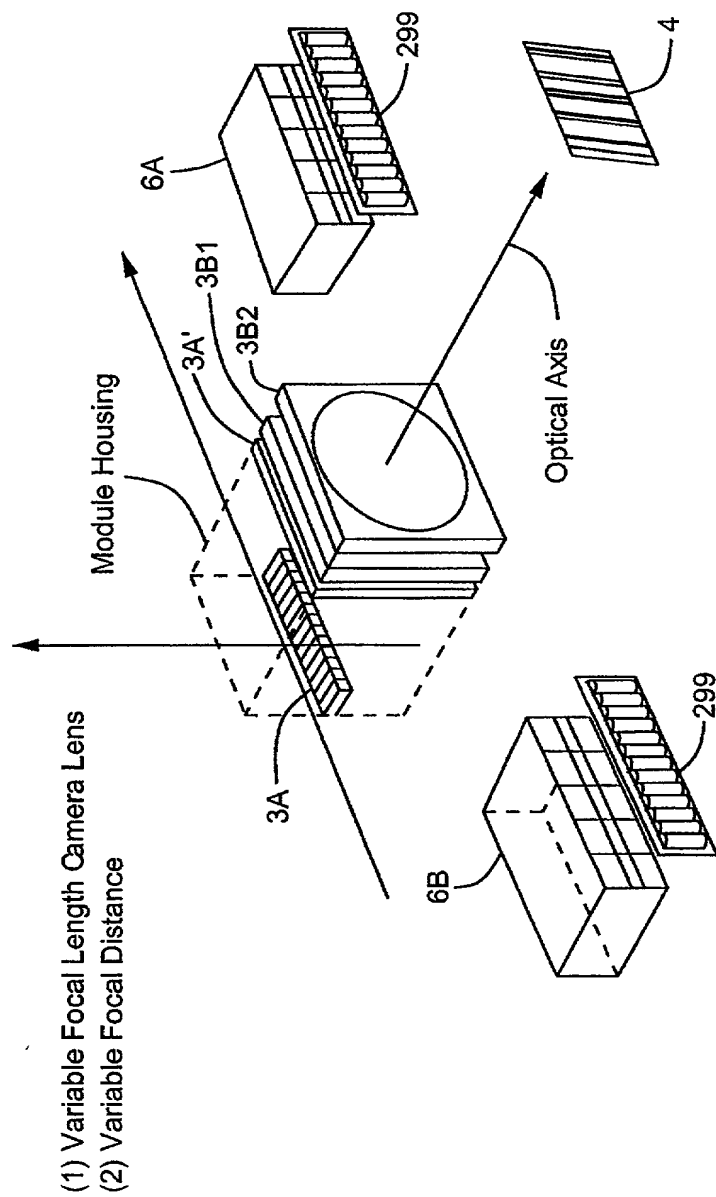


FIG. 3B2



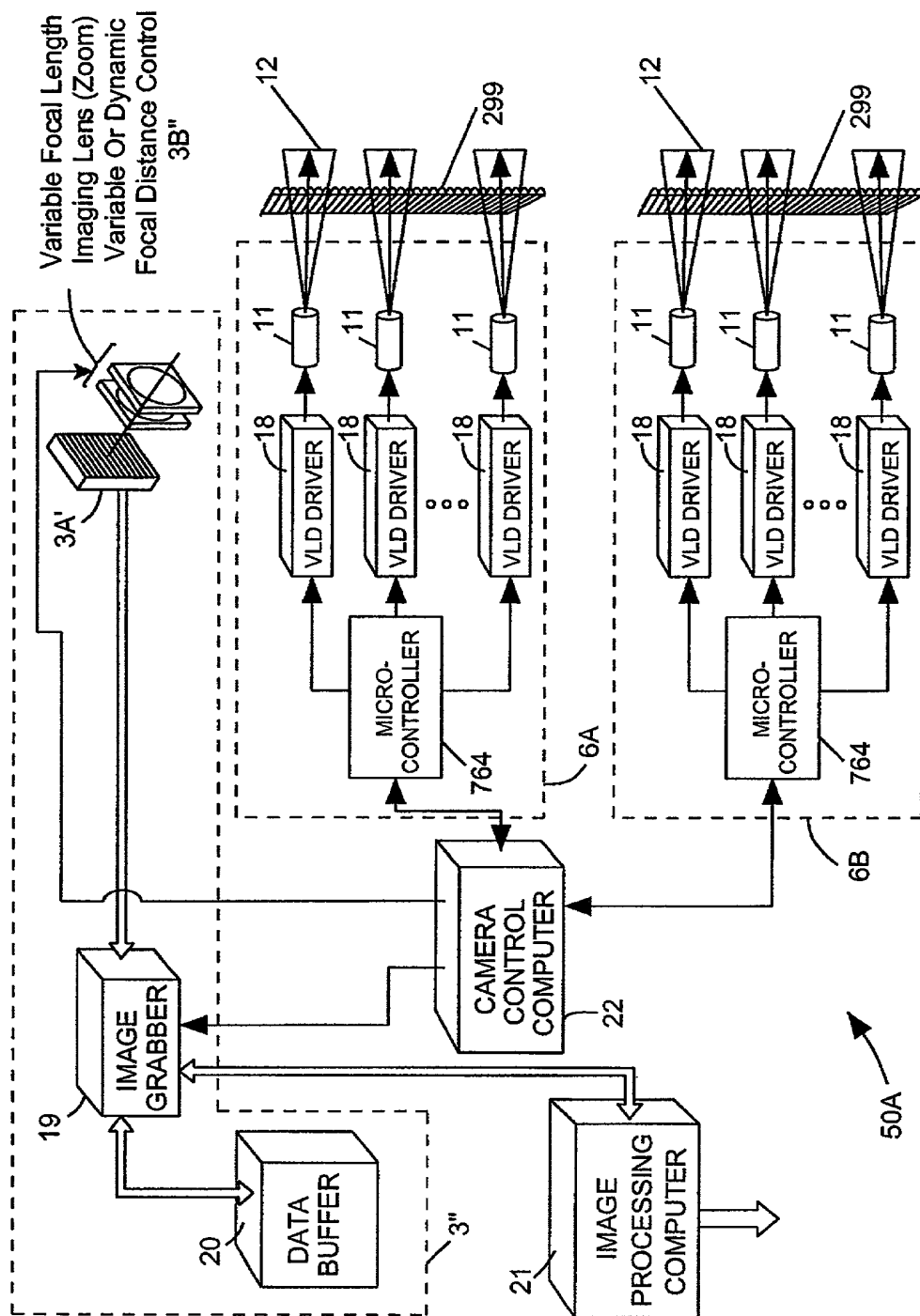


FIG. 3C1

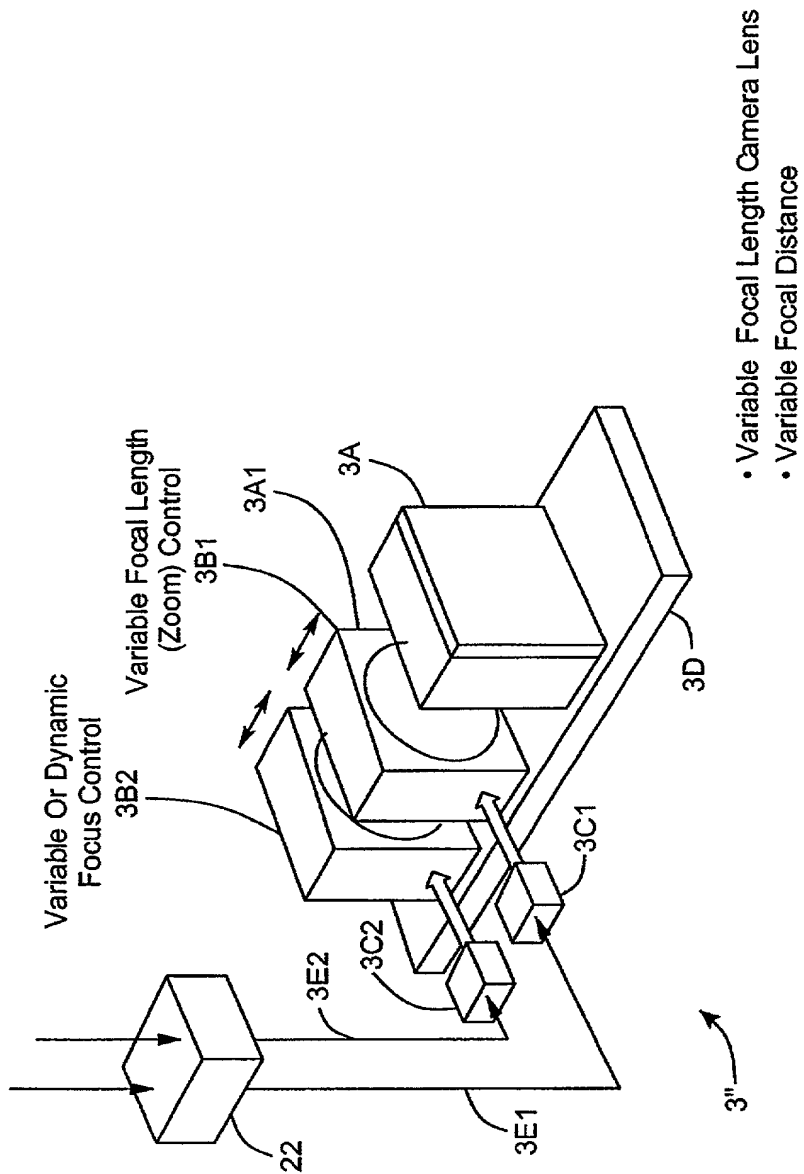


FIG. 3C2

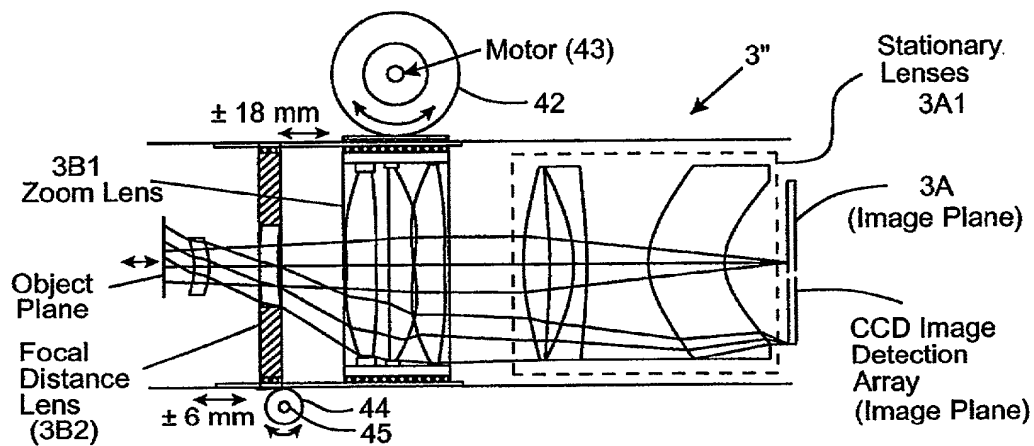


FIG. 3D1

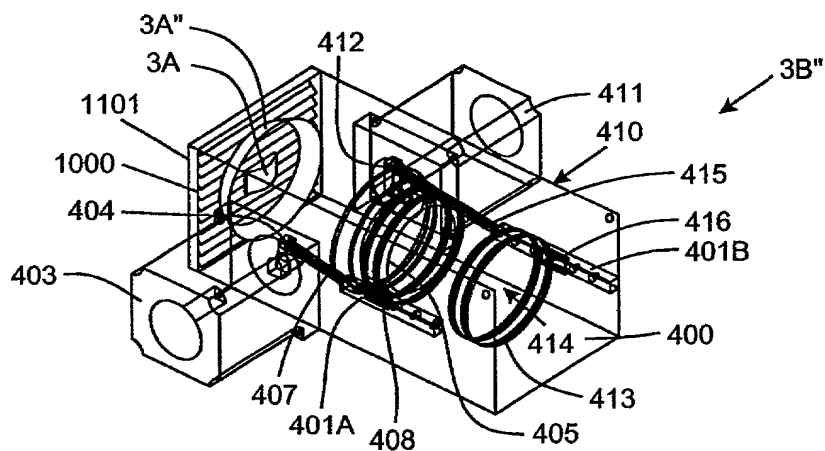


FIG. 3D2

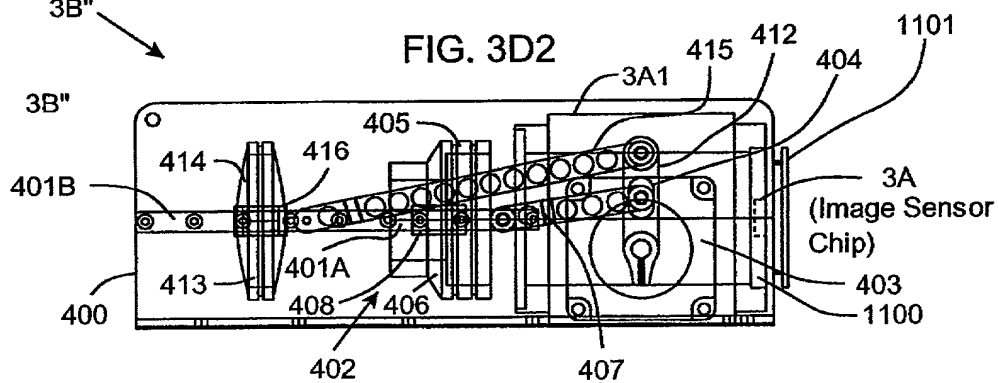


FIG. 3D3

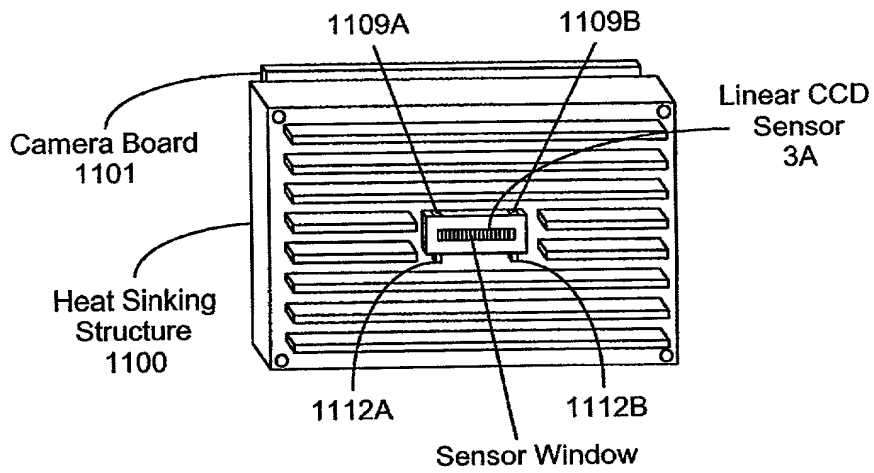


FIG. 3D4

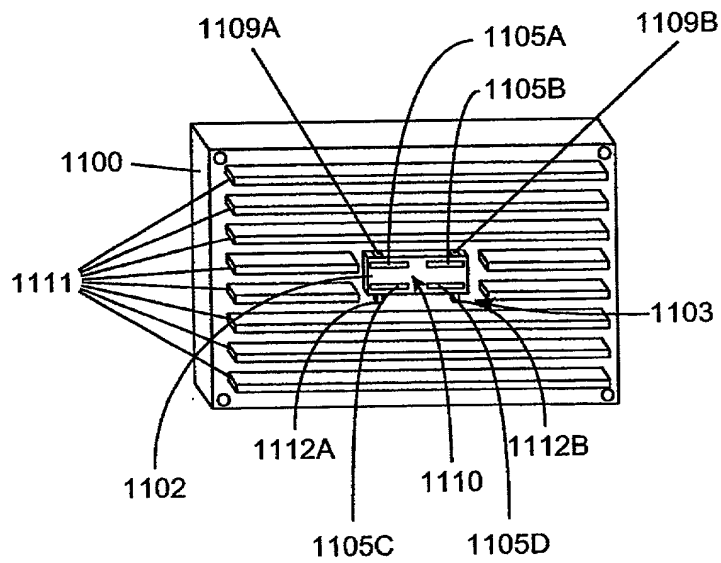


FIG. 3D5

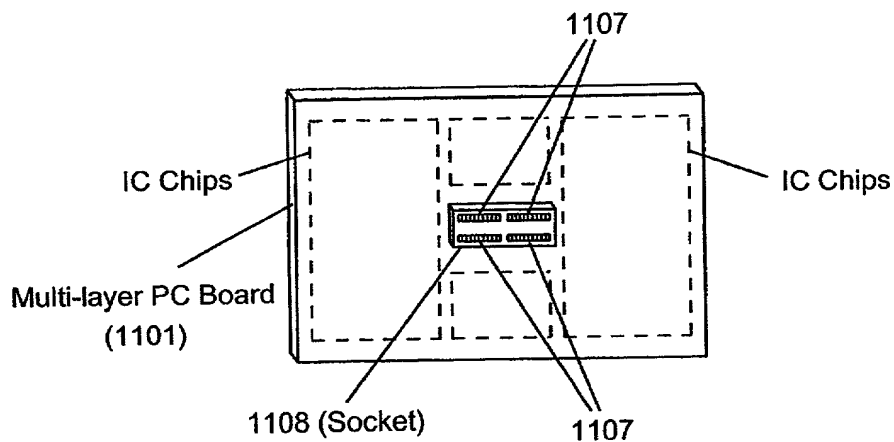


FIG. 3D6

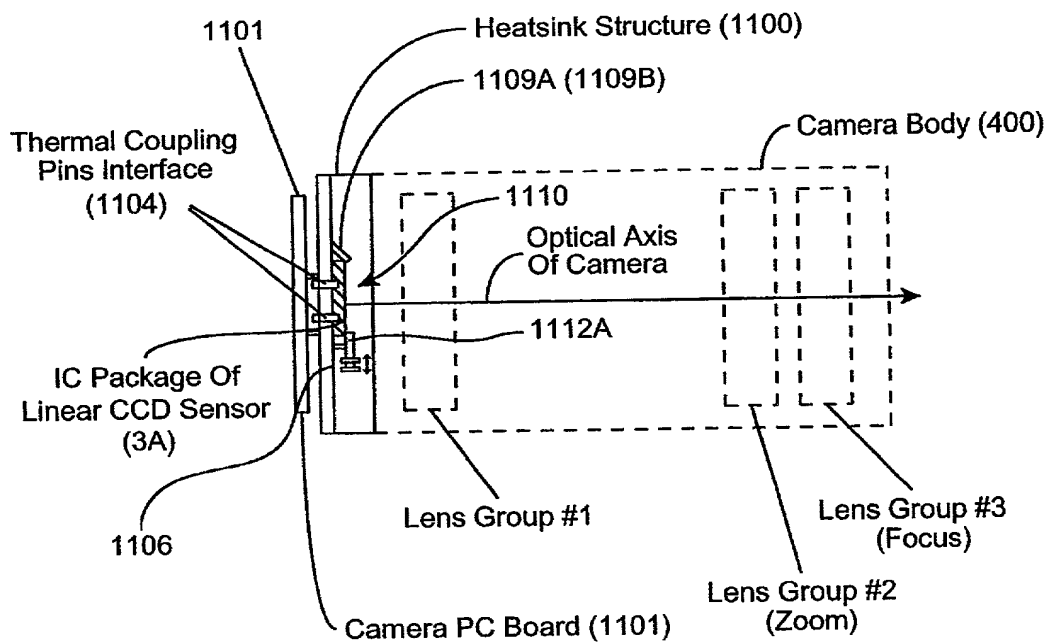


FIG. 3D7

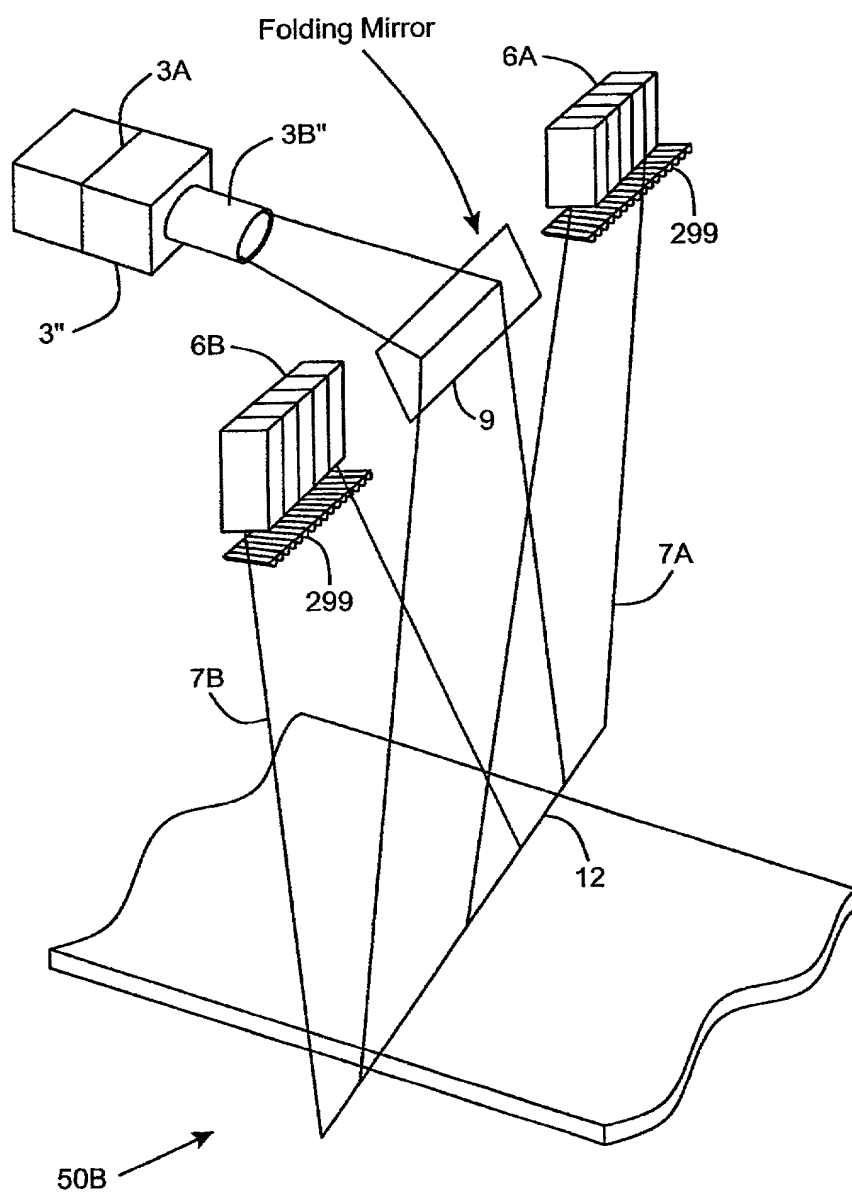


FIG. 3E1

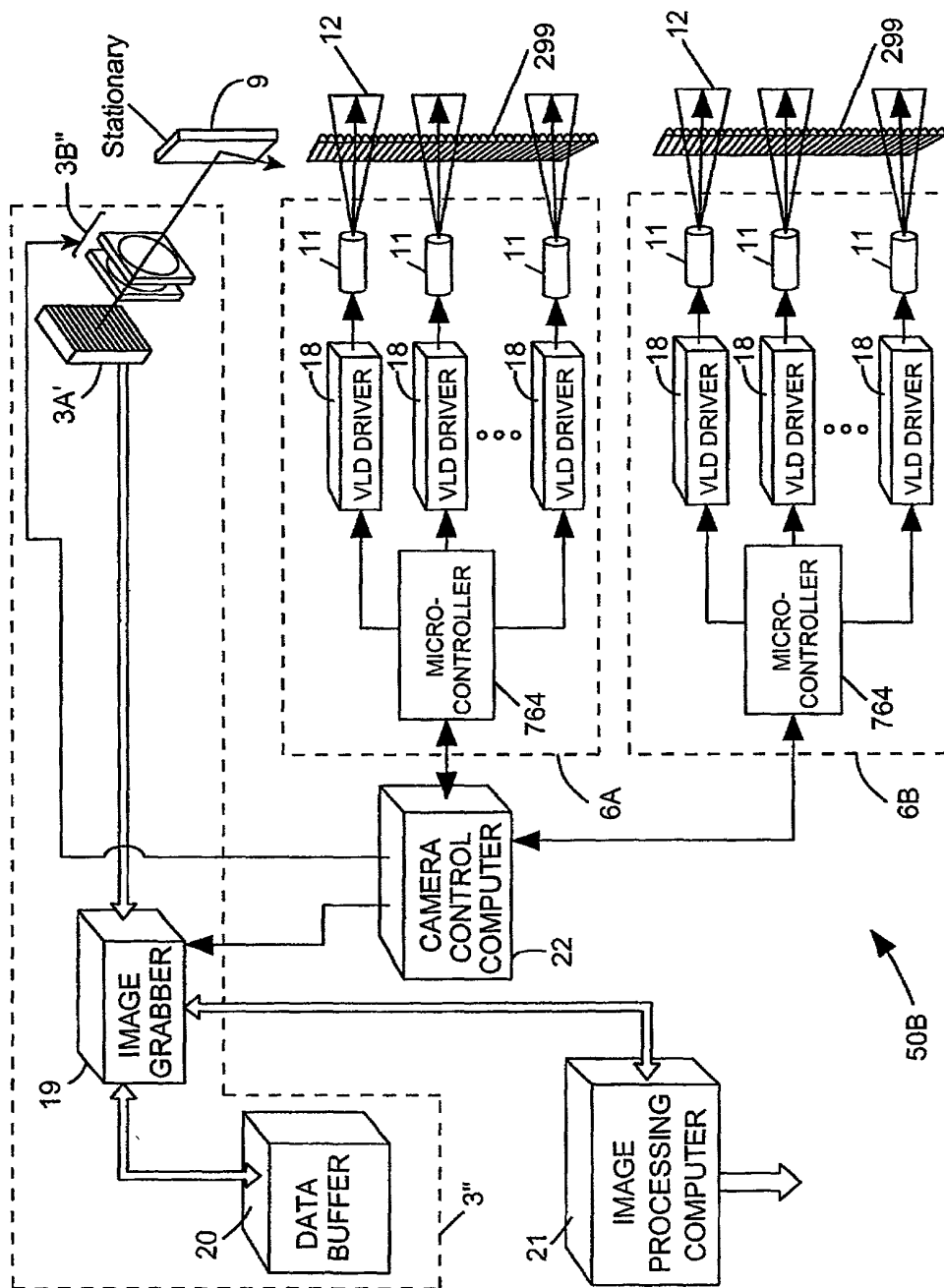


FIG. 3E2

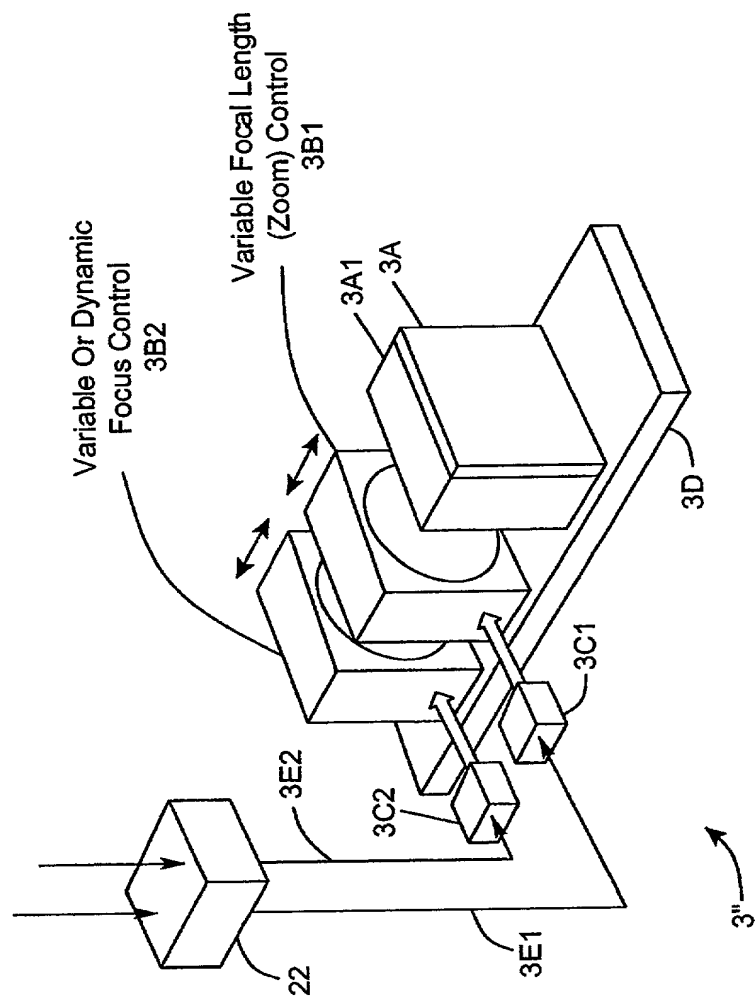


FIG. 3E3



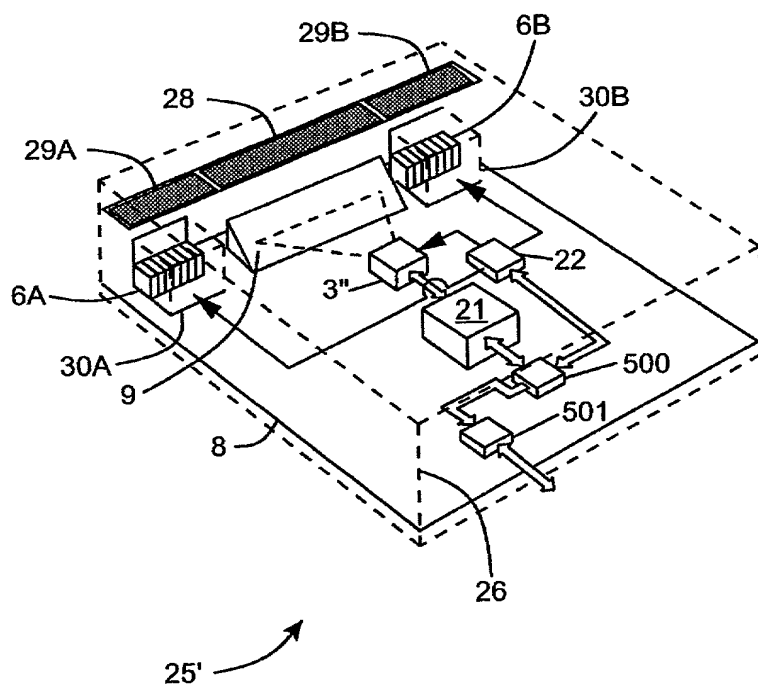


FIG. 3E4

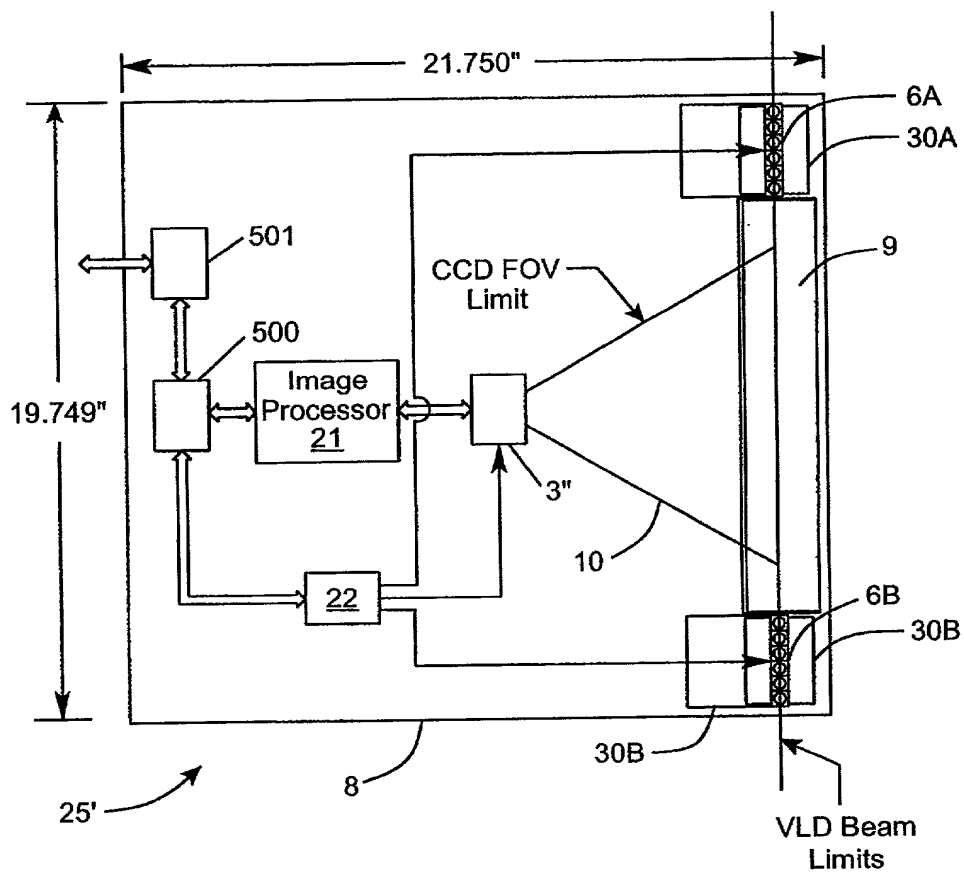


FIG. 3E5

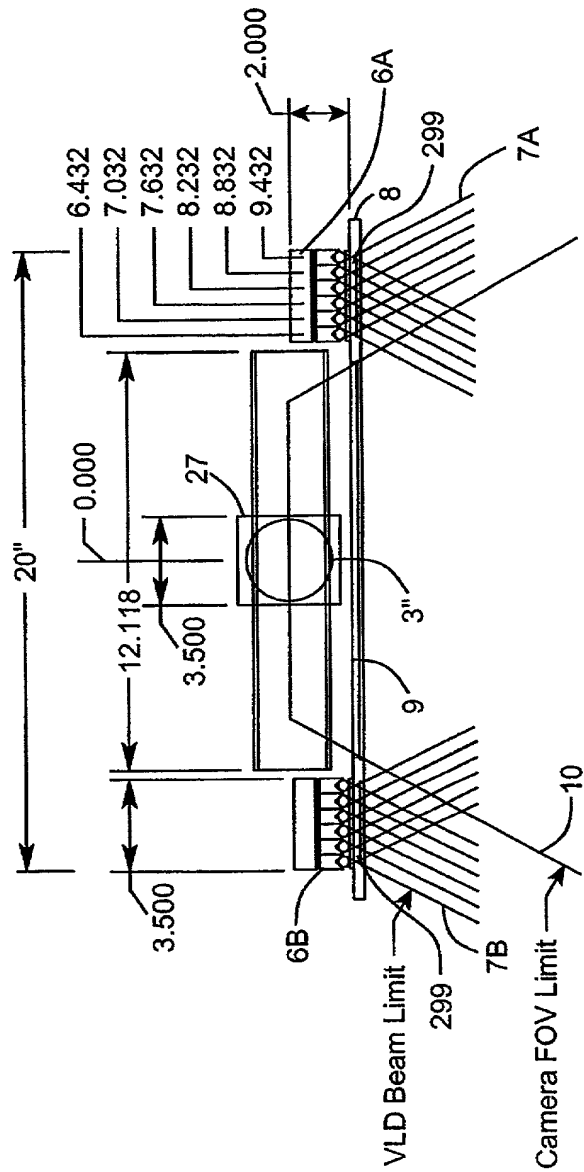


FIG. 3E6

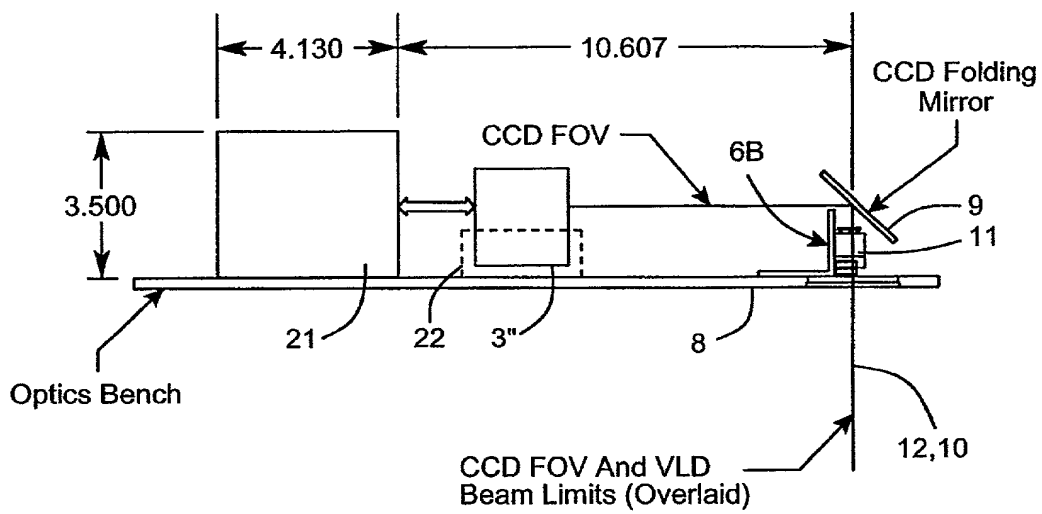


FIG. 3E7

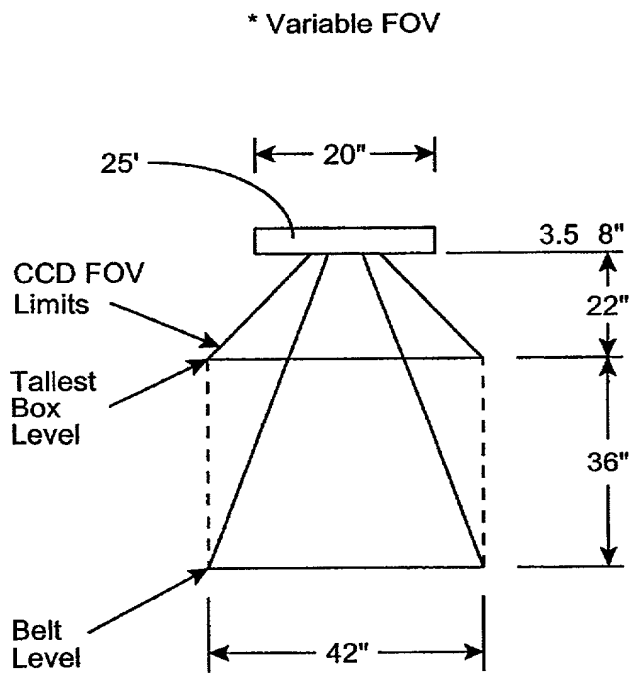


FIG. 3E8

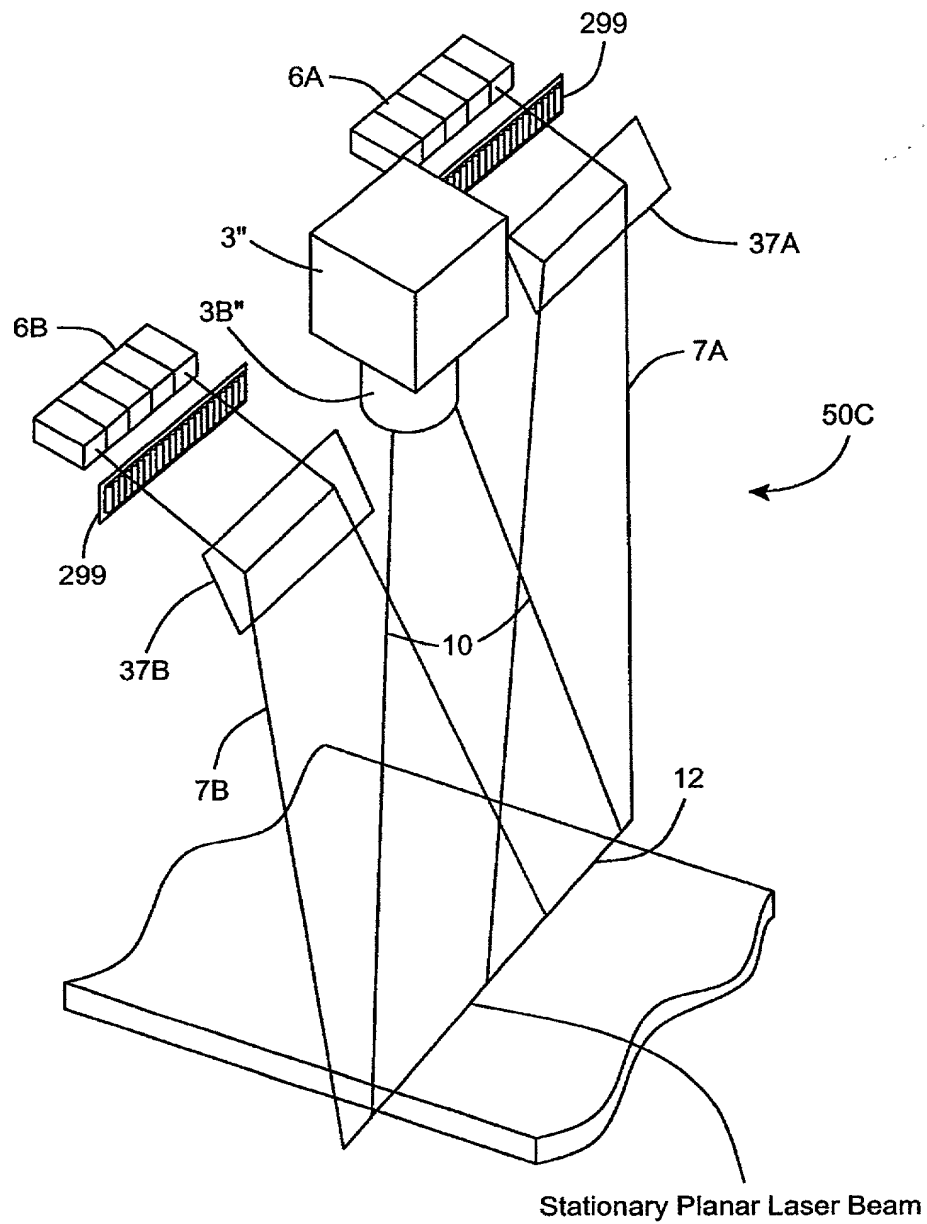


FIG. 3F1

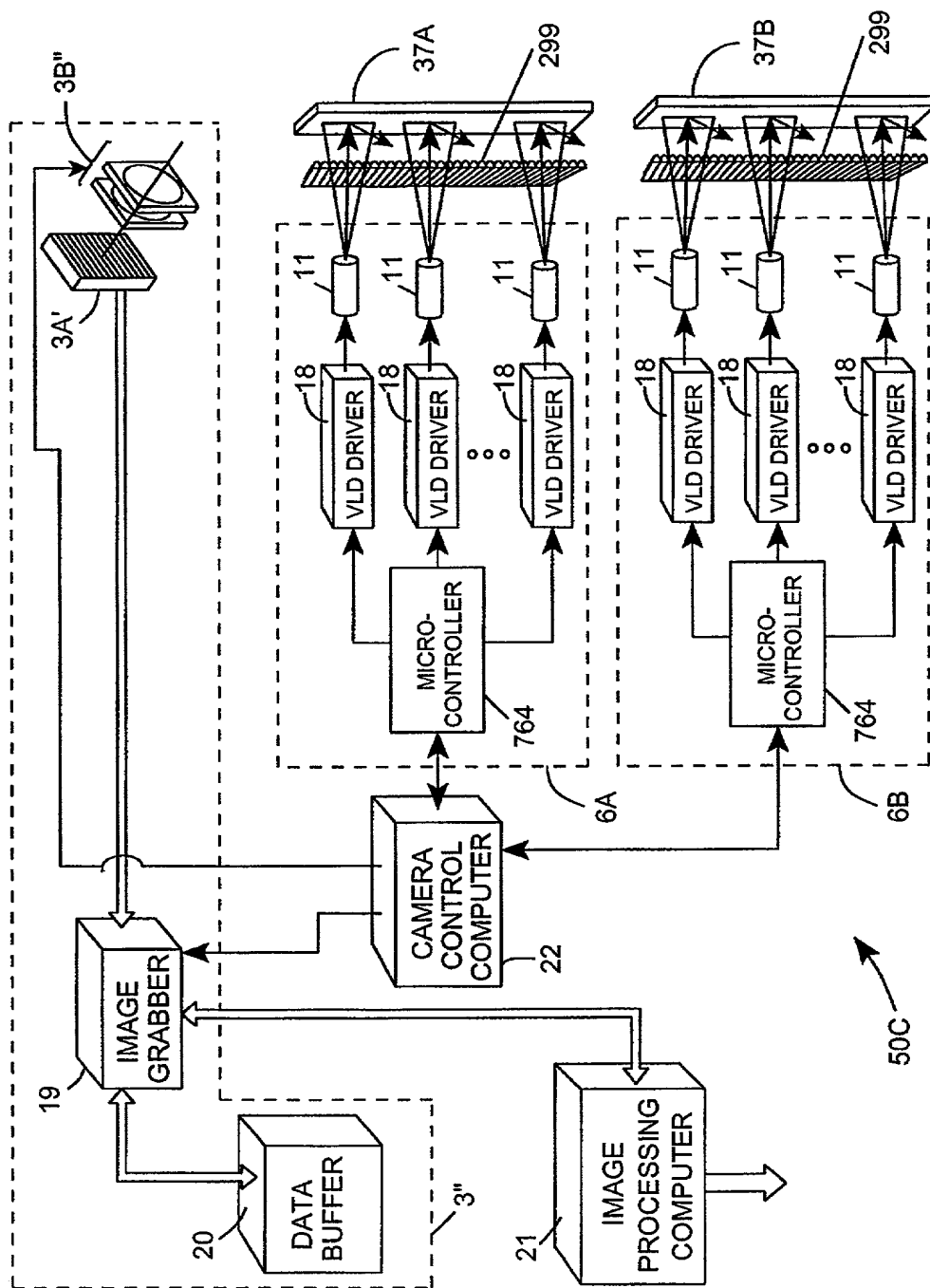
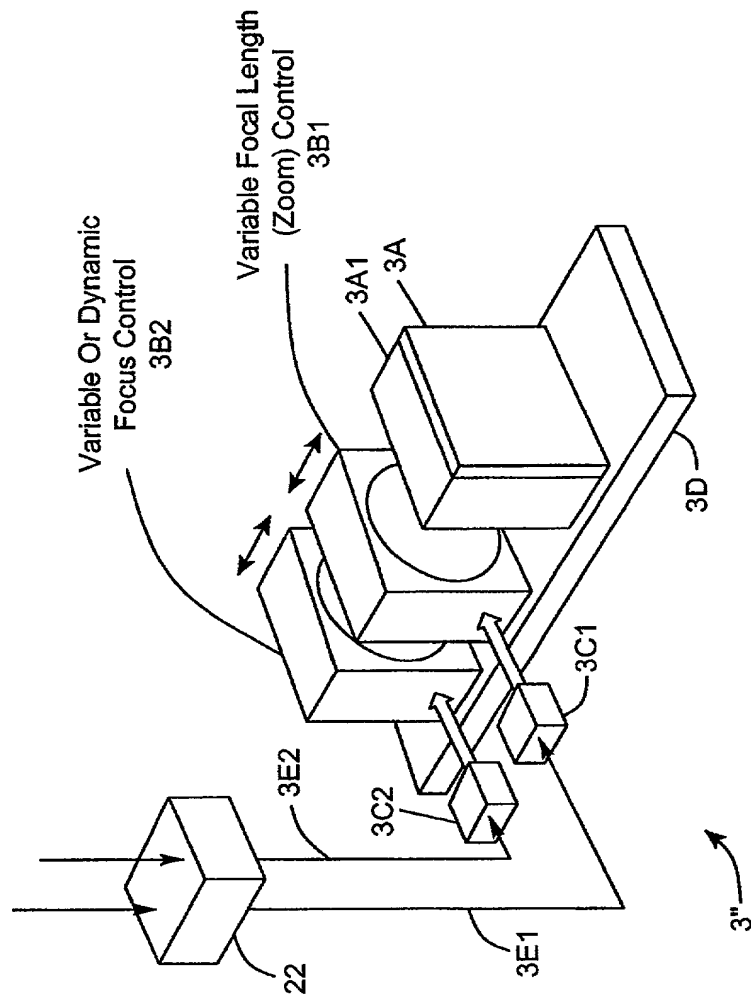


FIG. 3F2



**FIG. 3F3**



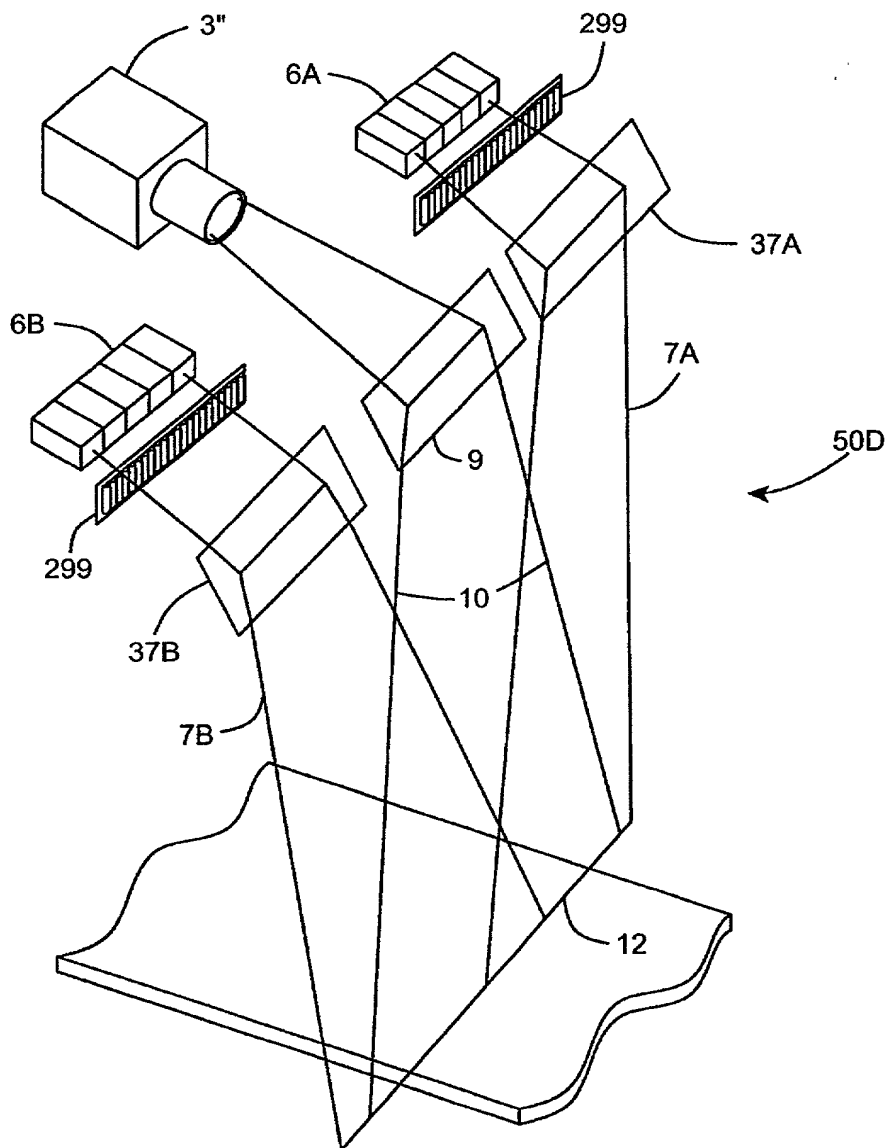


FIG. 3G1

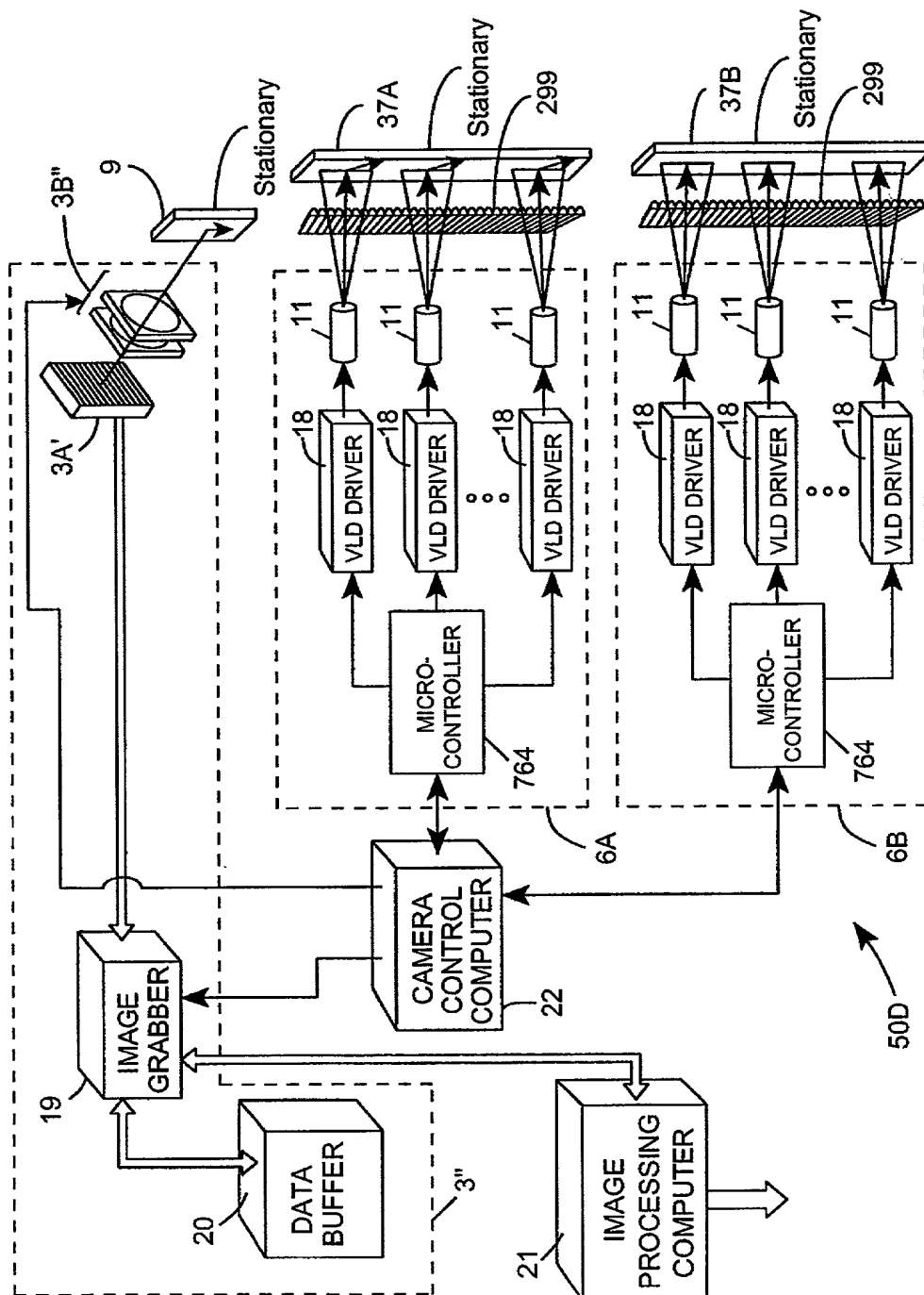


FIG. 3G2

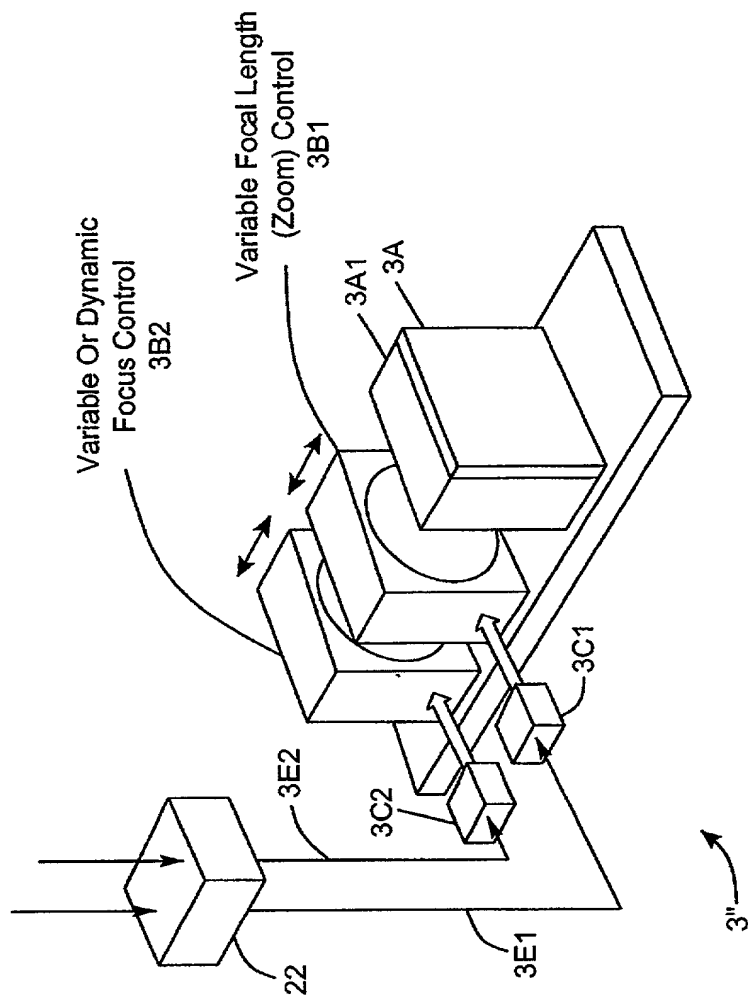


FIG. 3G3

- Variable Focal Length Imaging Lens
- Variable Focal Distance

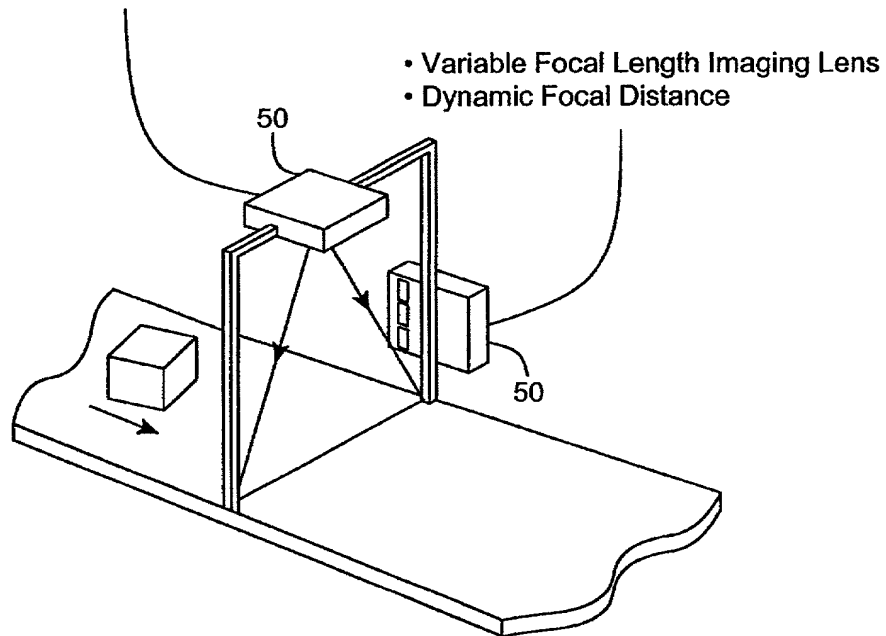


FIG. 3H

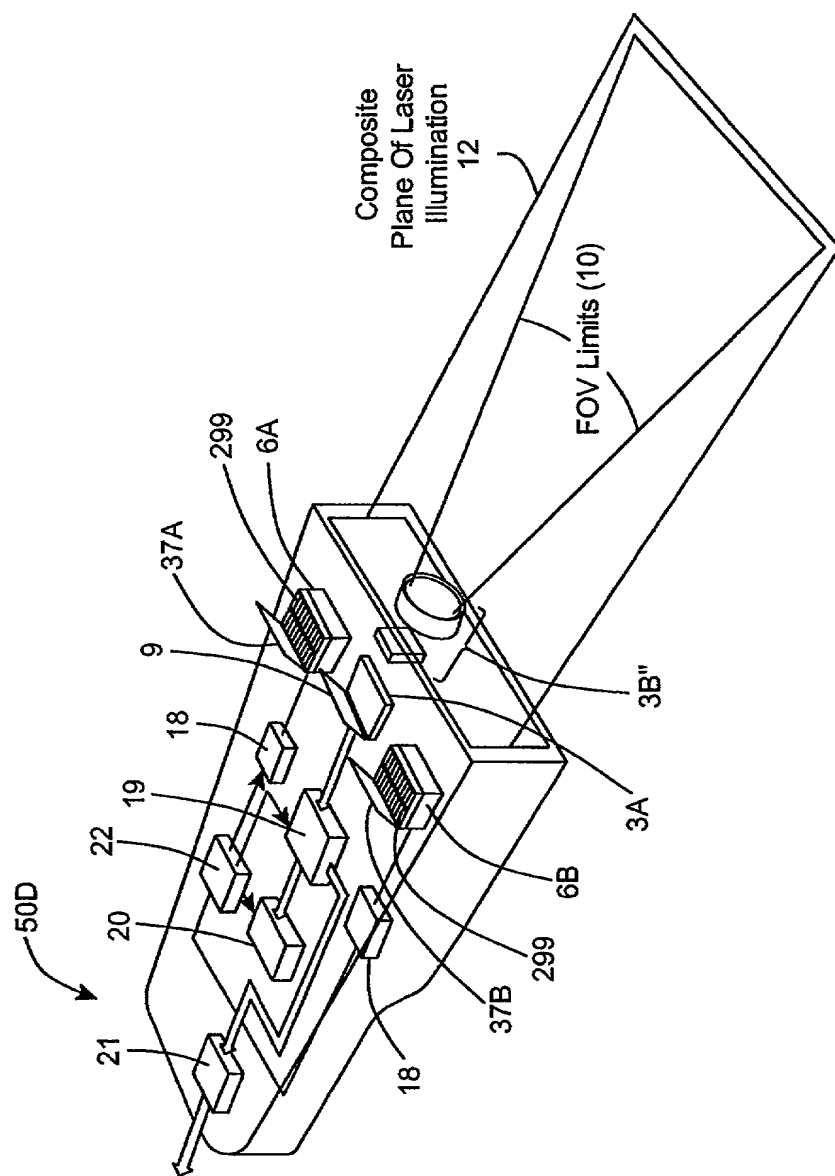


FIG. 31

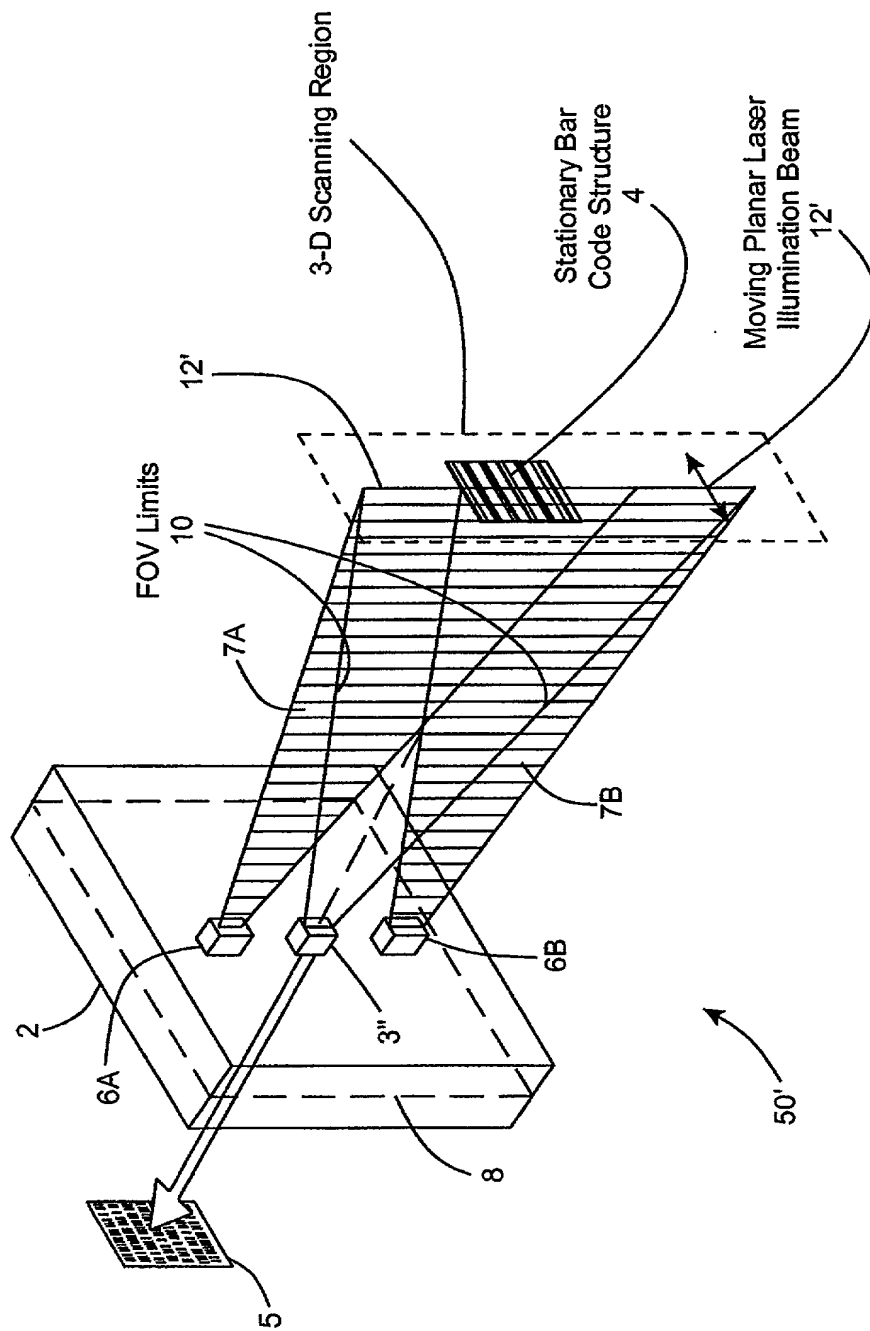


FIG. 3J1

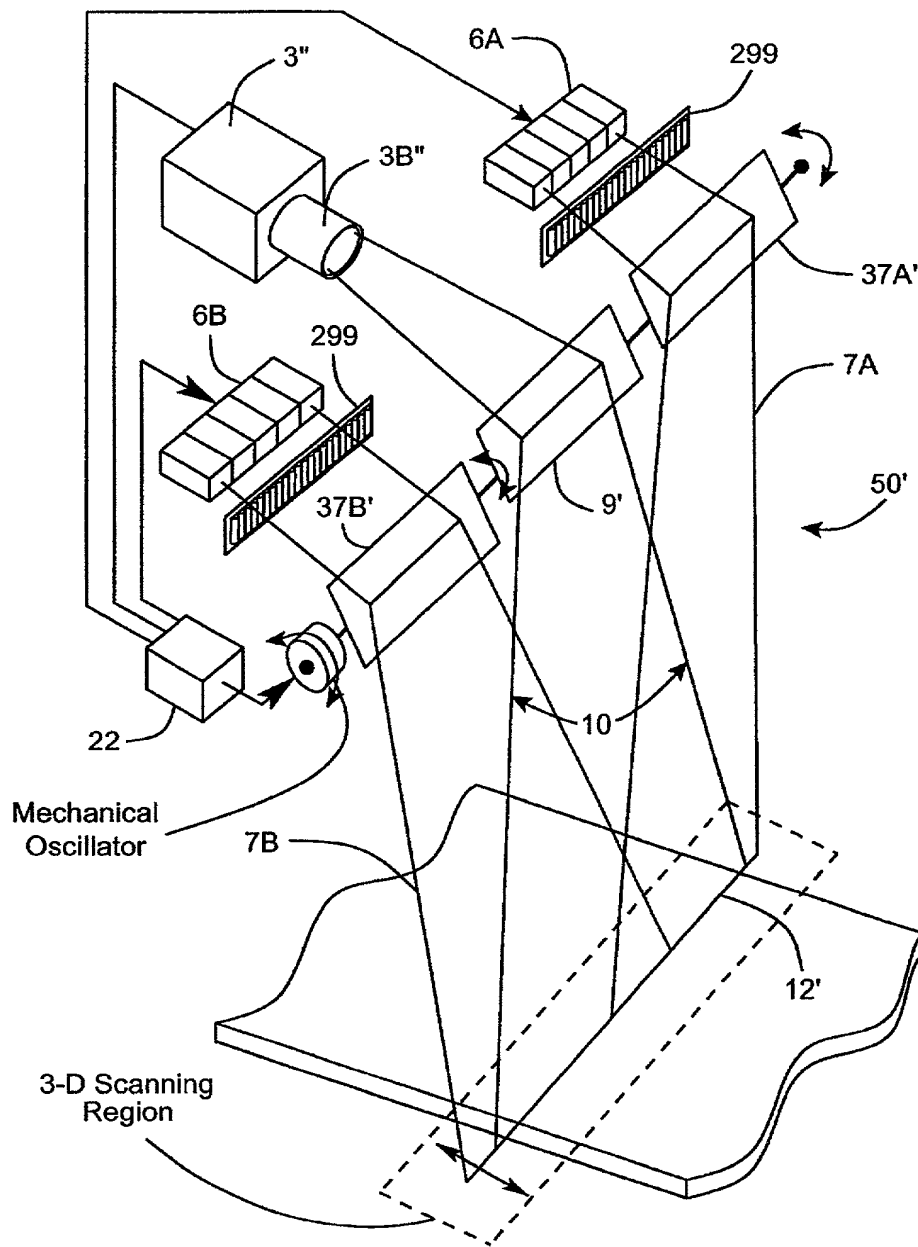


FIG. 3J2

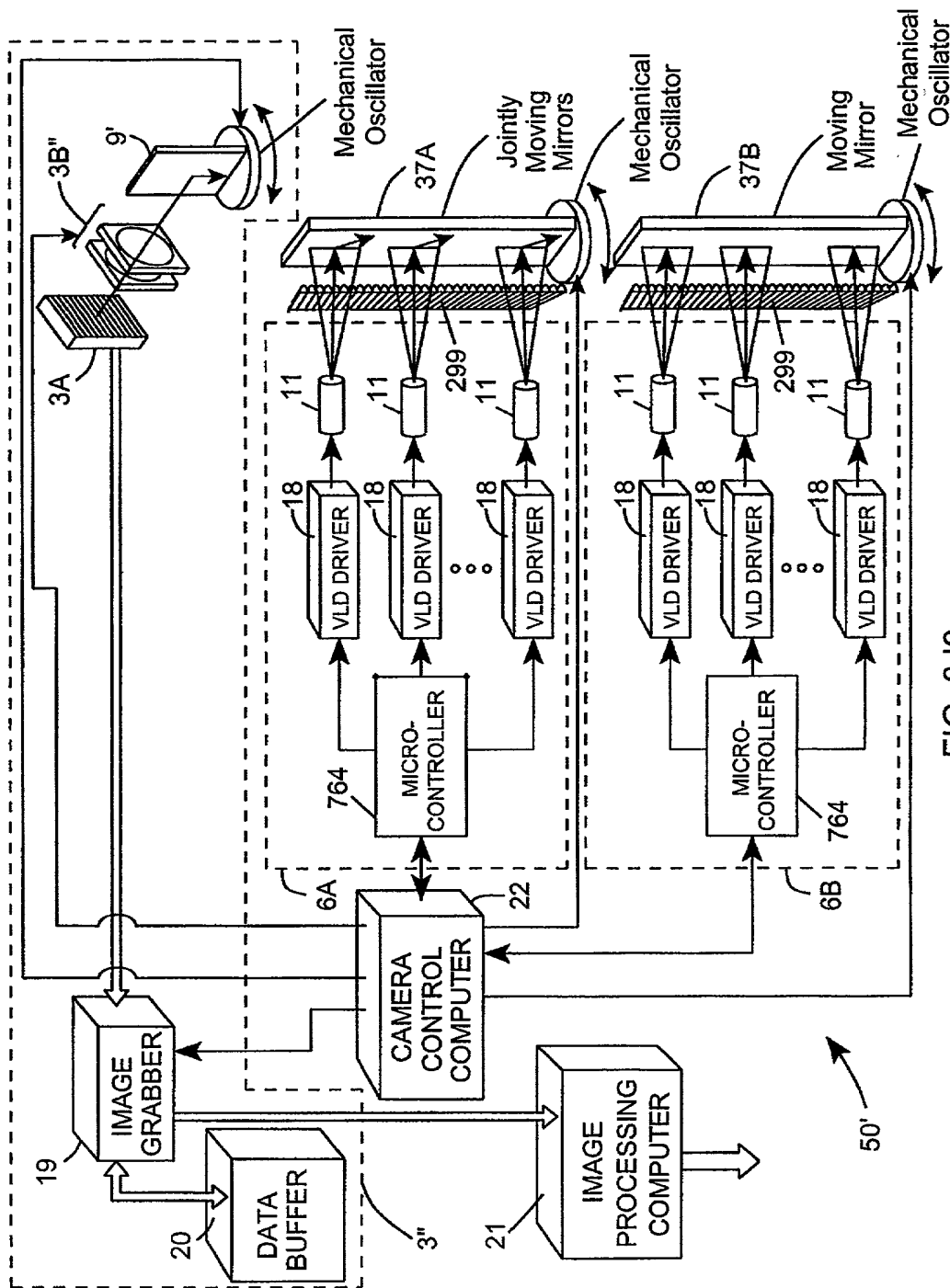


FIG. 3J3



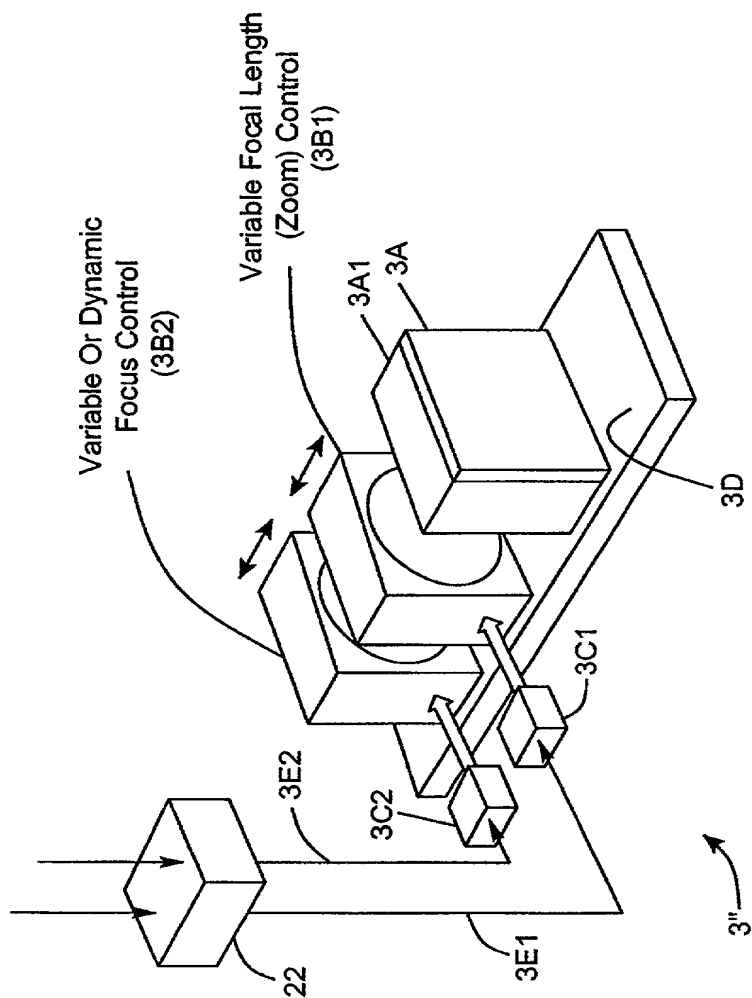
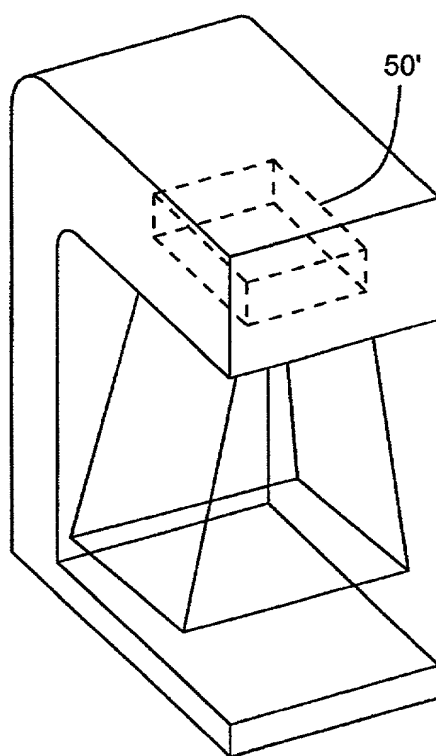


FIG. 3J4





2-D Hold-under Scanner

FIG. 3J6

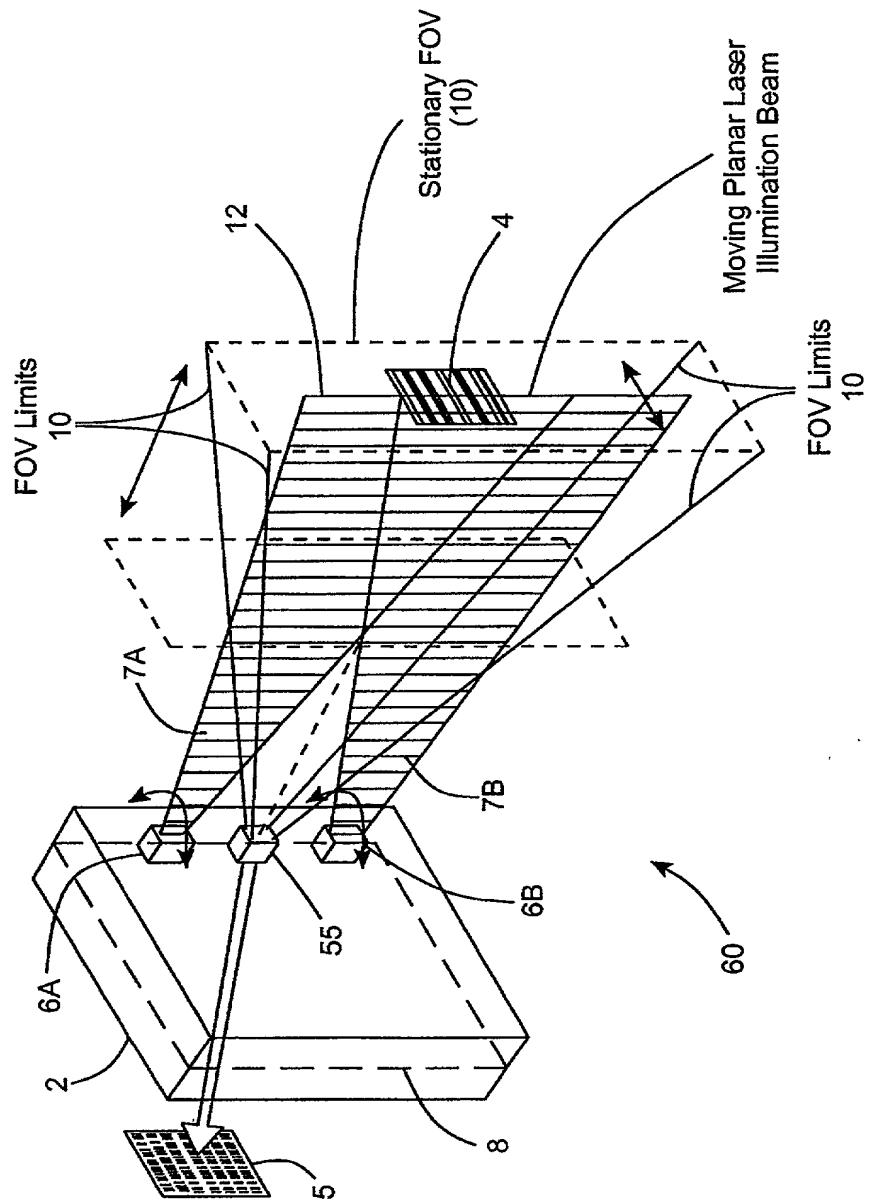


FIG. 4A

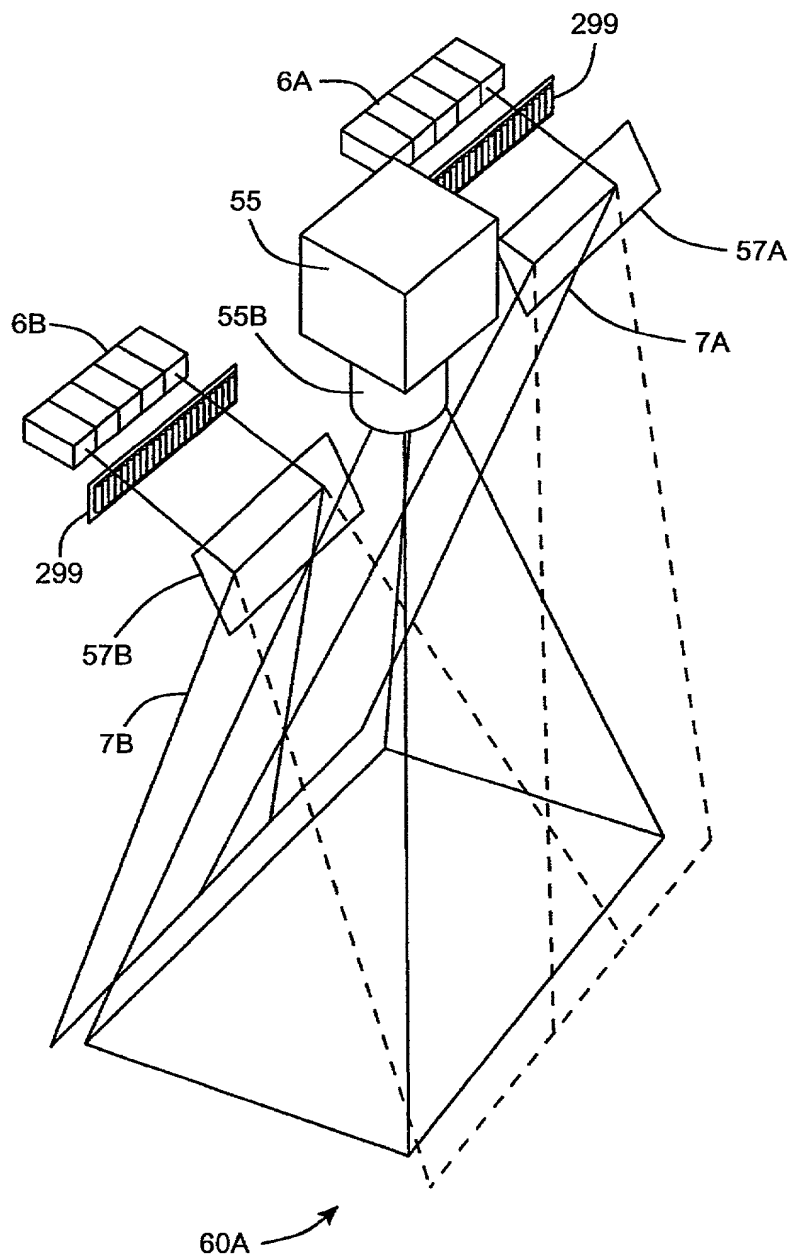


FIG. 4B1

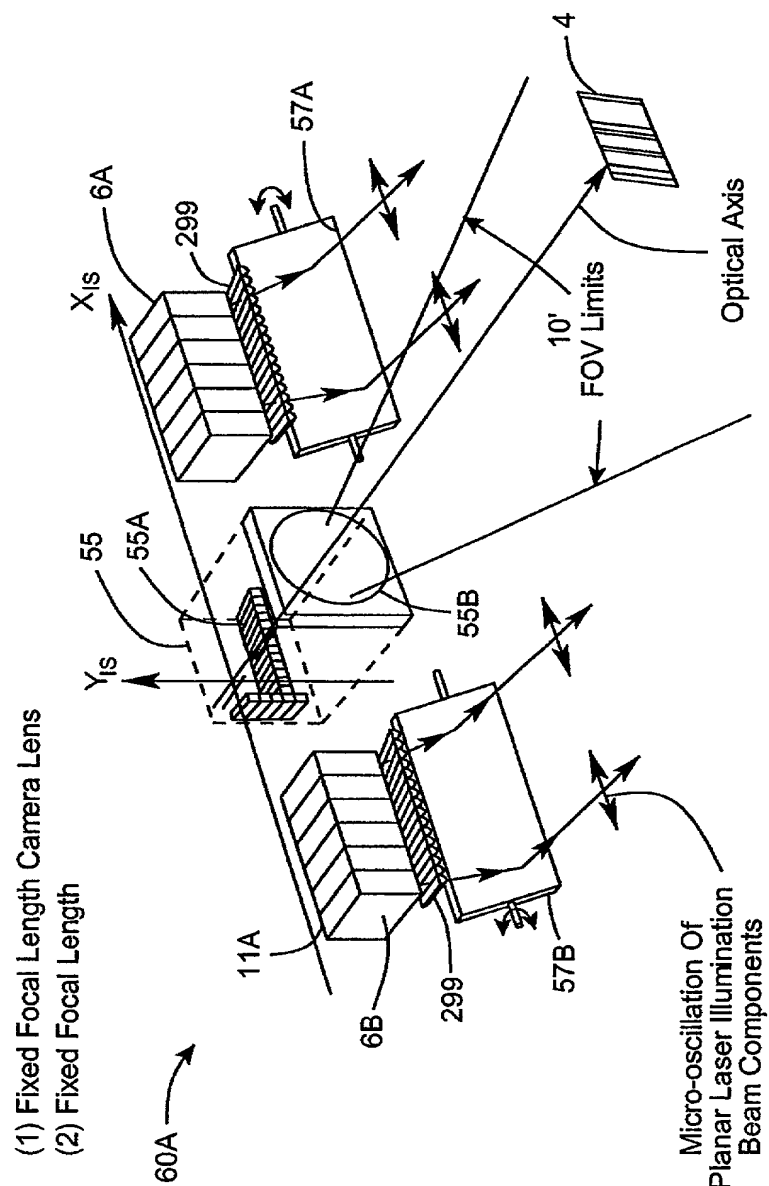


FIG. 4B2

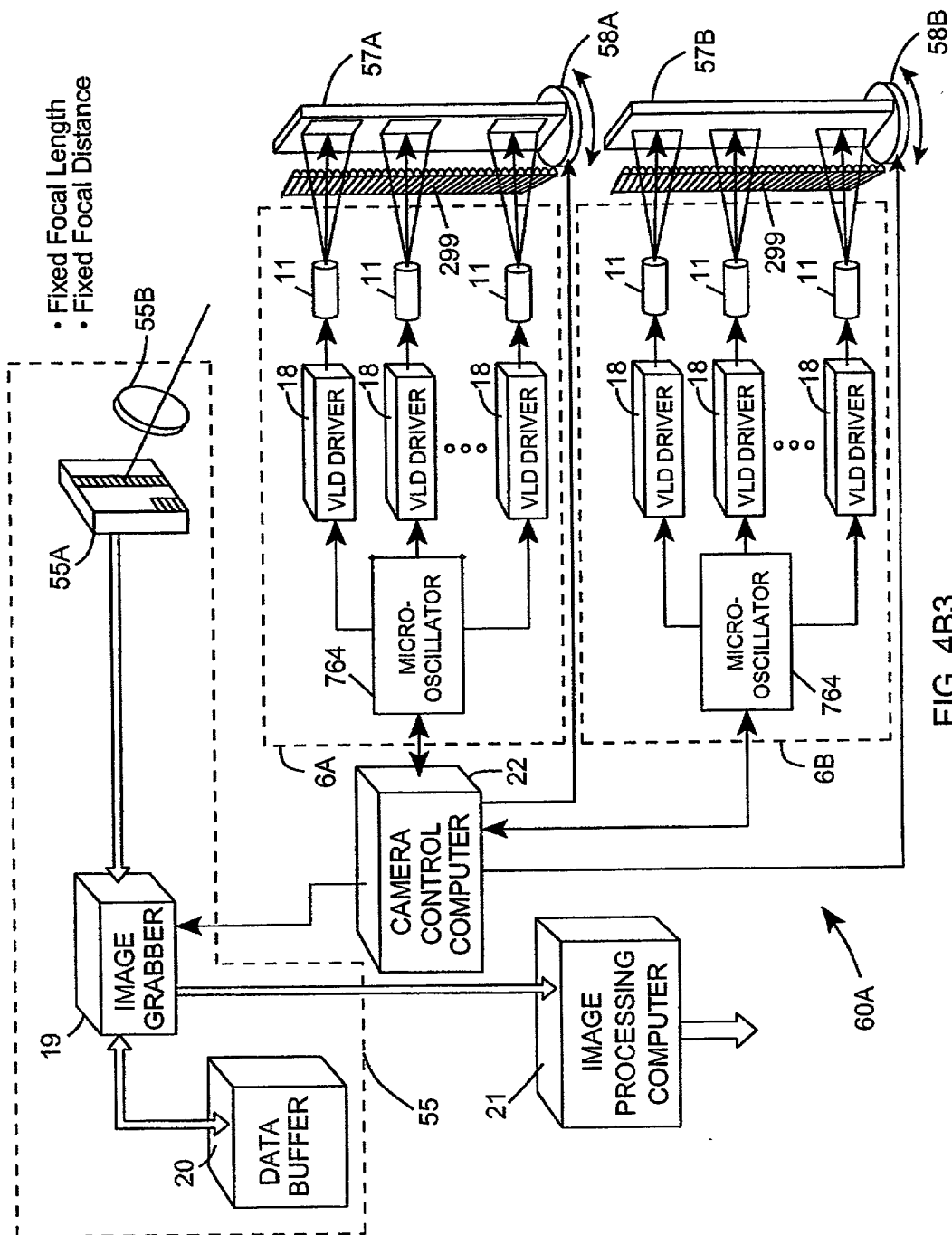


FIG. 4B3

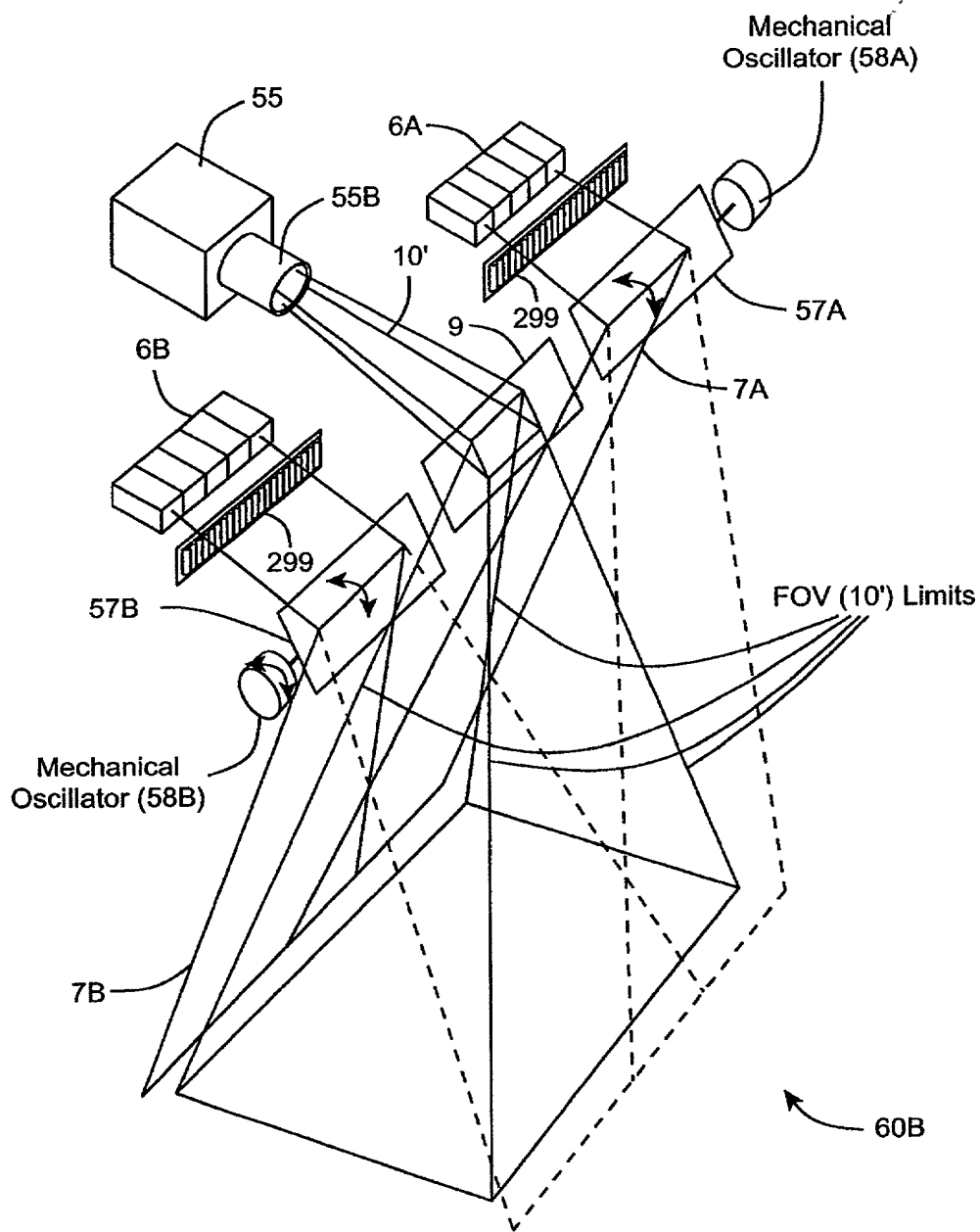


FIG. 4C1



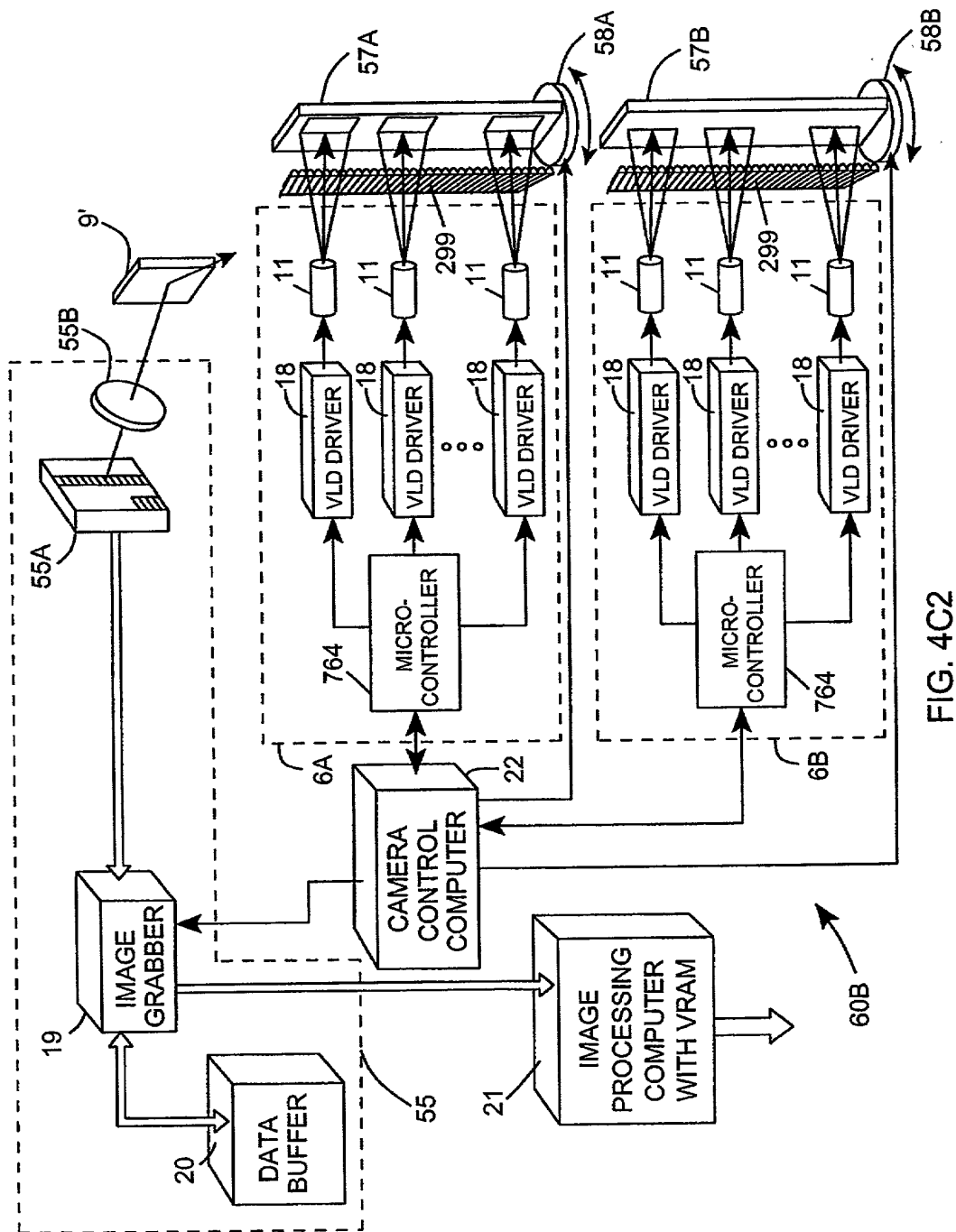
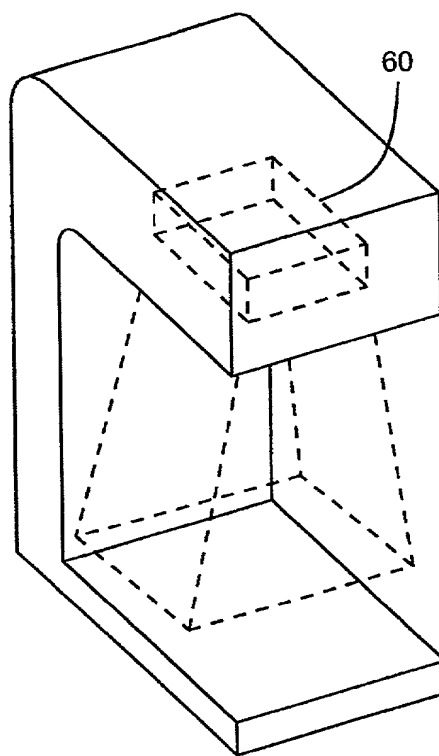
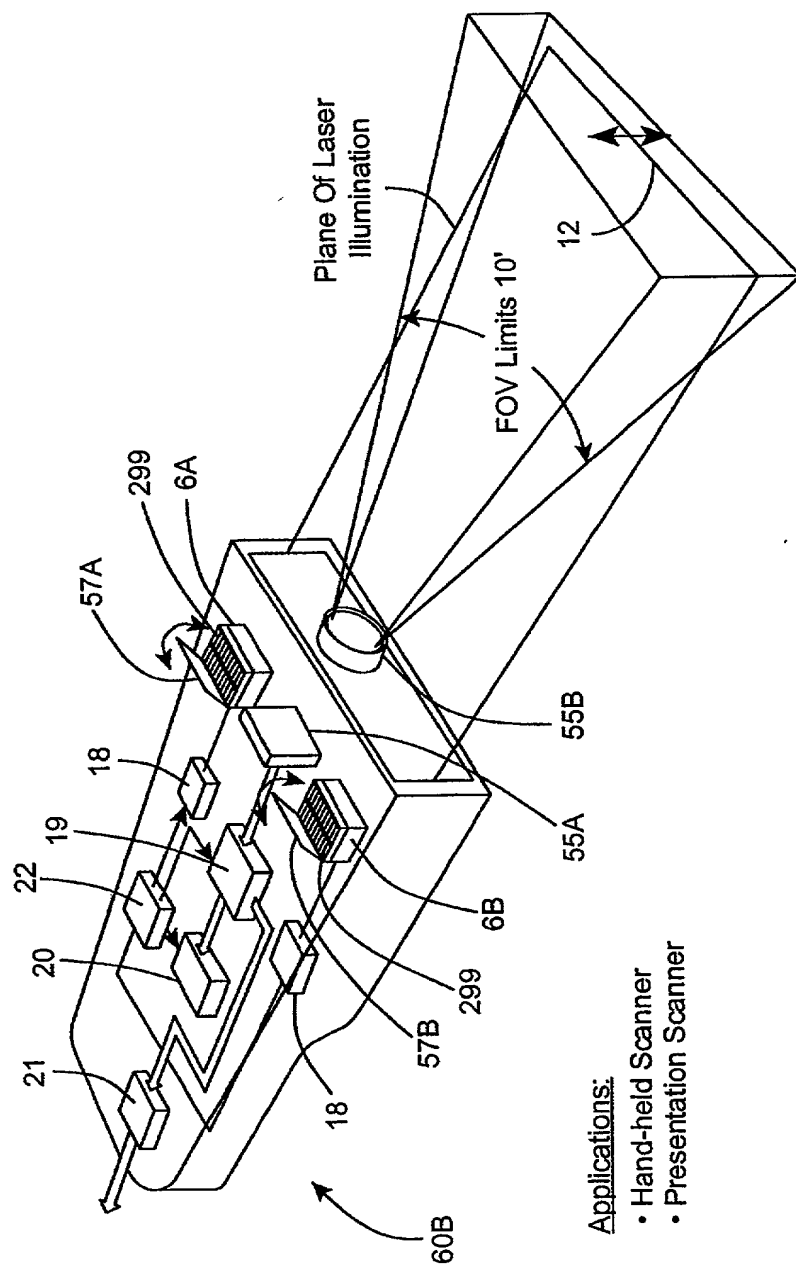


FIG. 4C2



2-D Hold-under Scanner

FIG. 4D



Applications:

- Hand-held Scanner
- Presentation Scanner

FIG. 4E

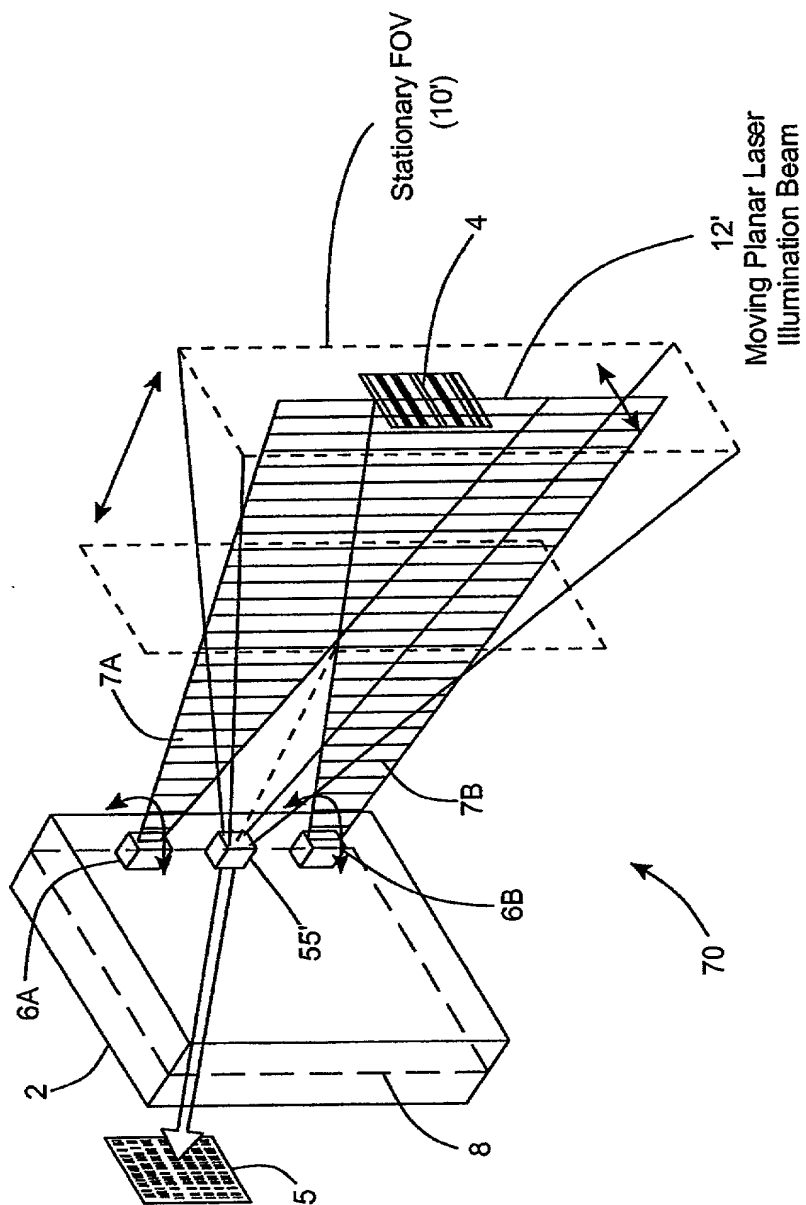


FIG. 5A

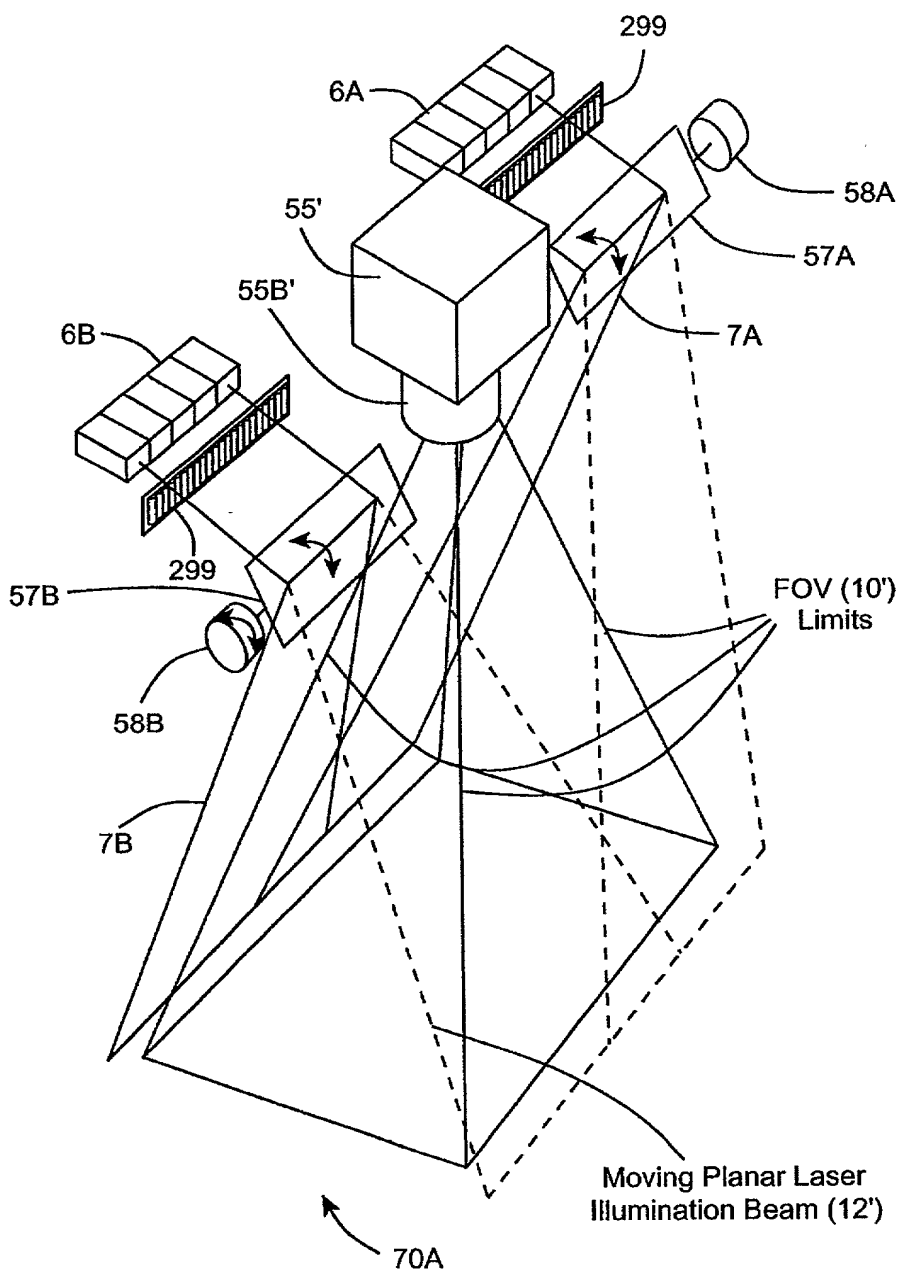


FIG. 5B1

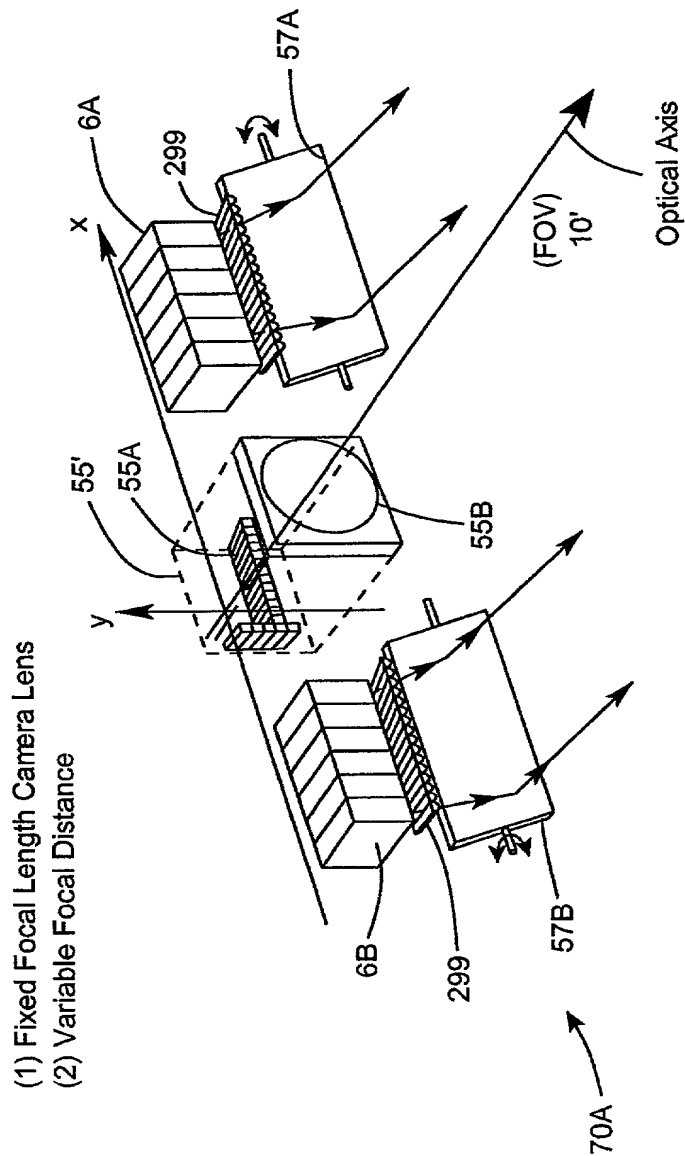


FIG. 5B2

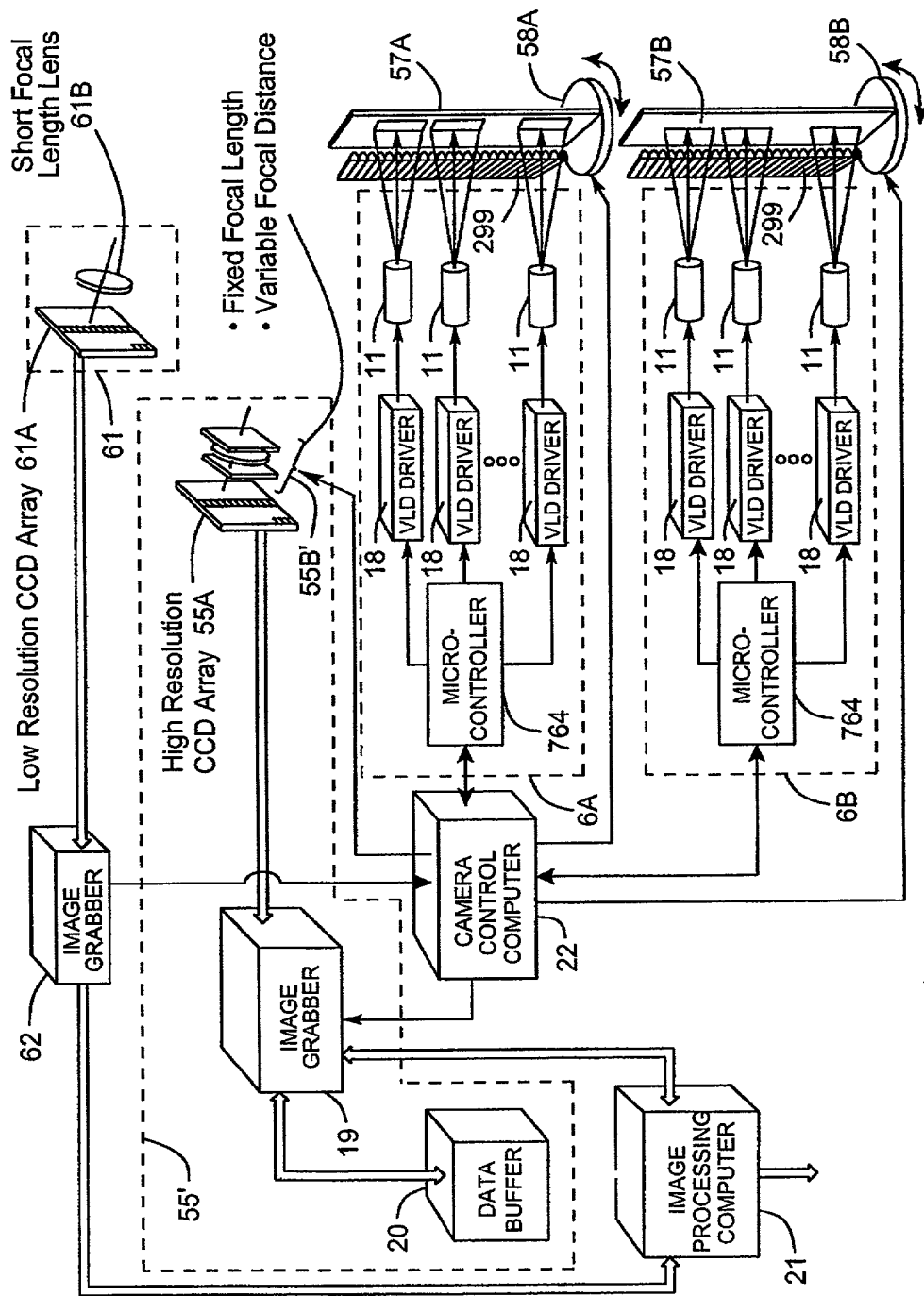


FIG. 5B3

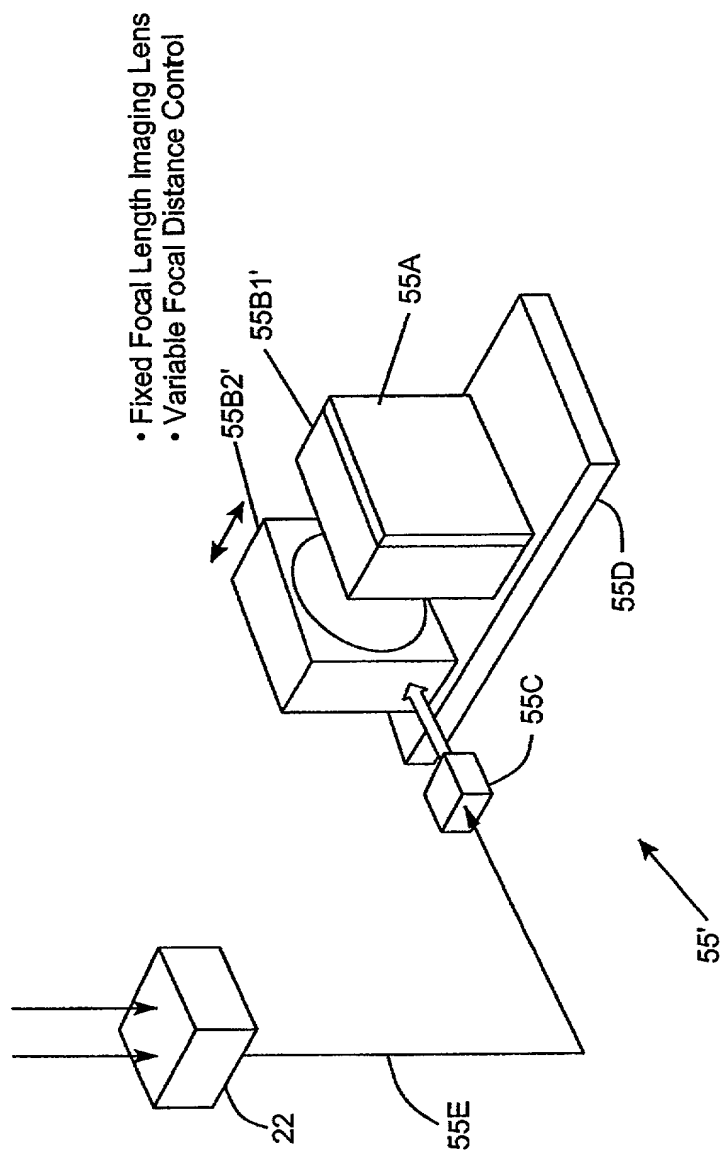


FIG. 5B4



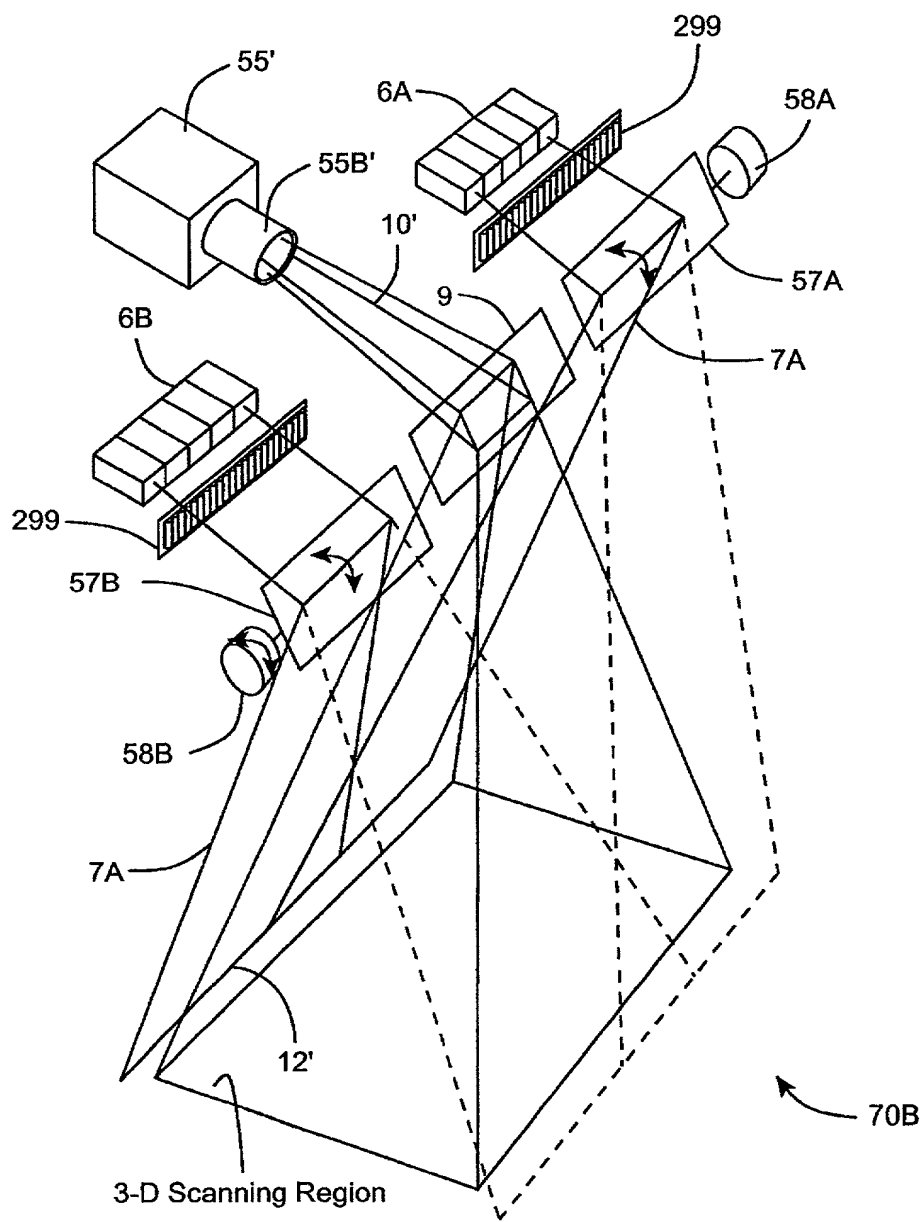
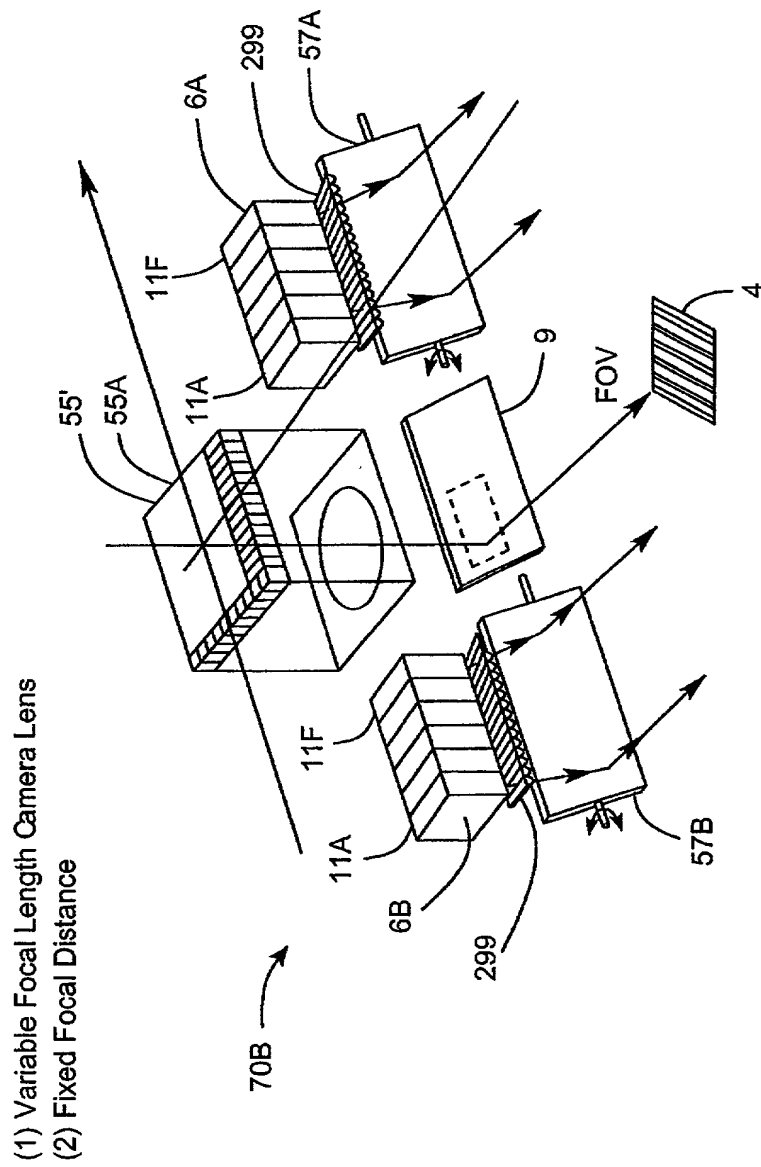


FIG. 5C1



**FIG. 5C2**



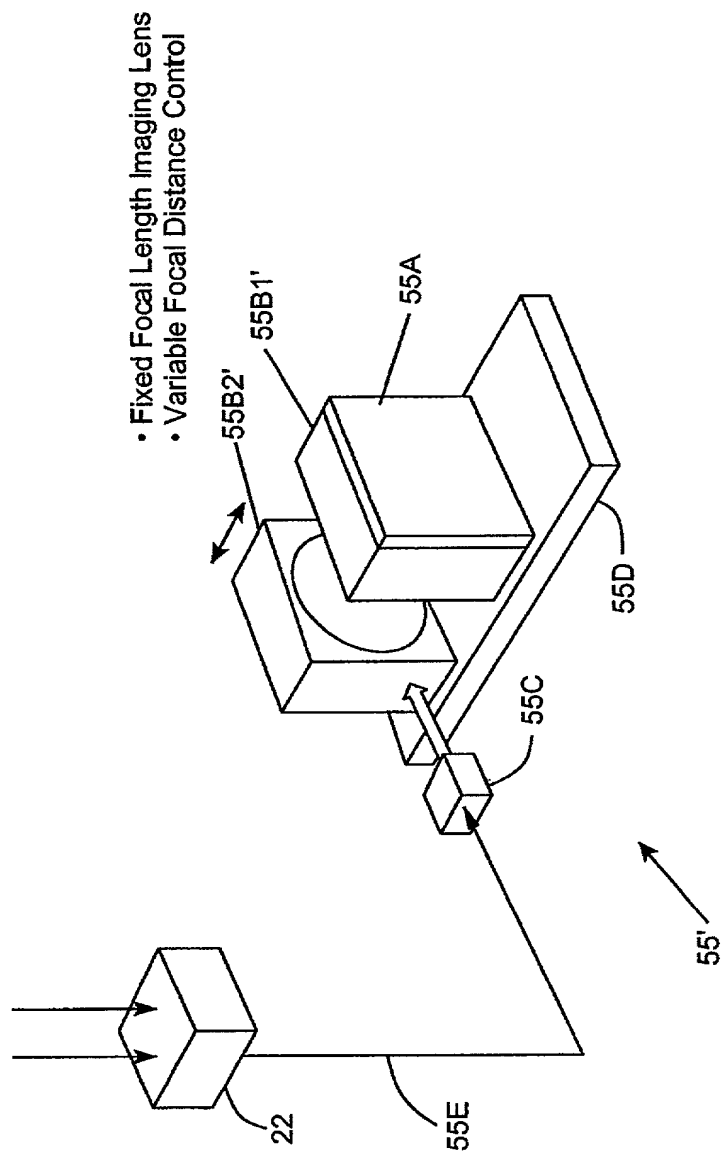


FIG. 5C4

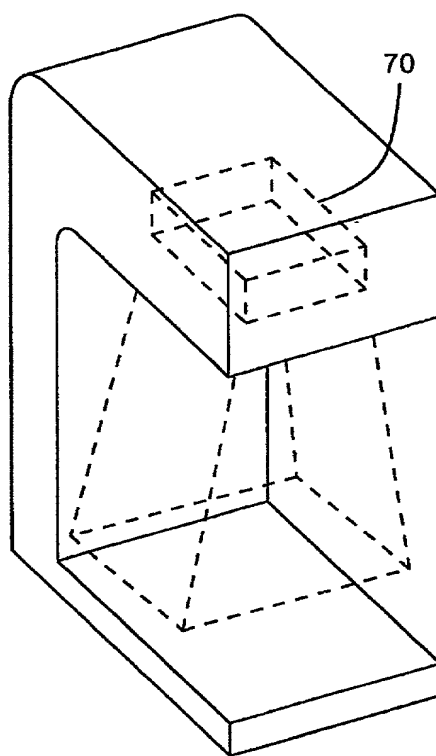


FIG. 5D

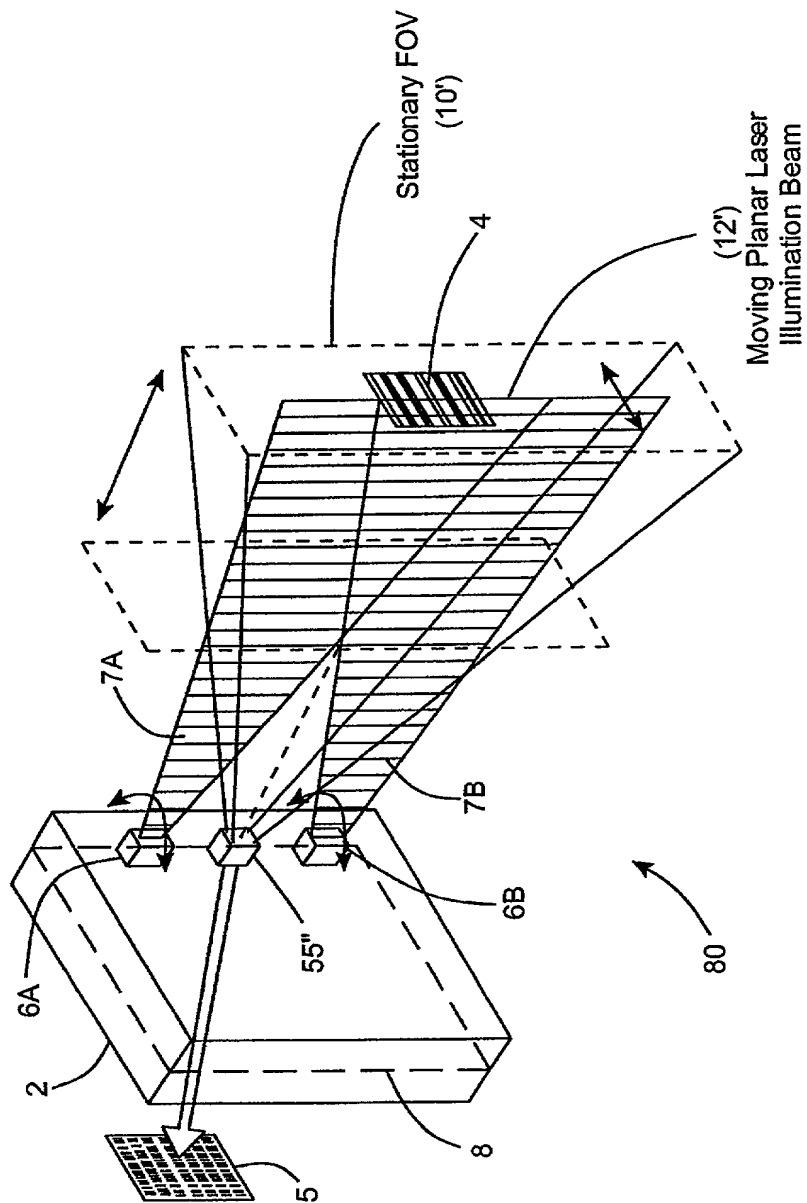


FIG. 6A

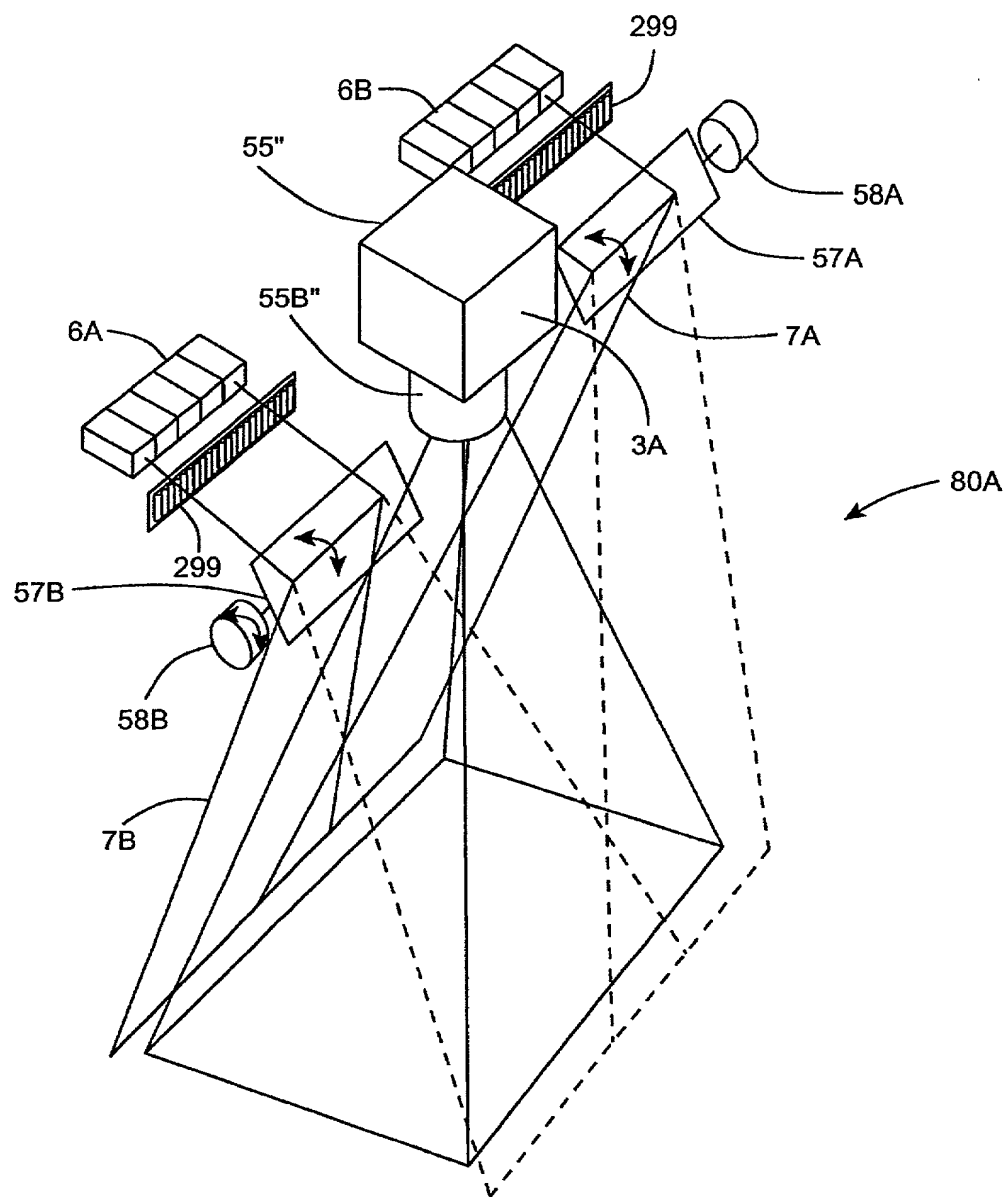


FIG. 6B1

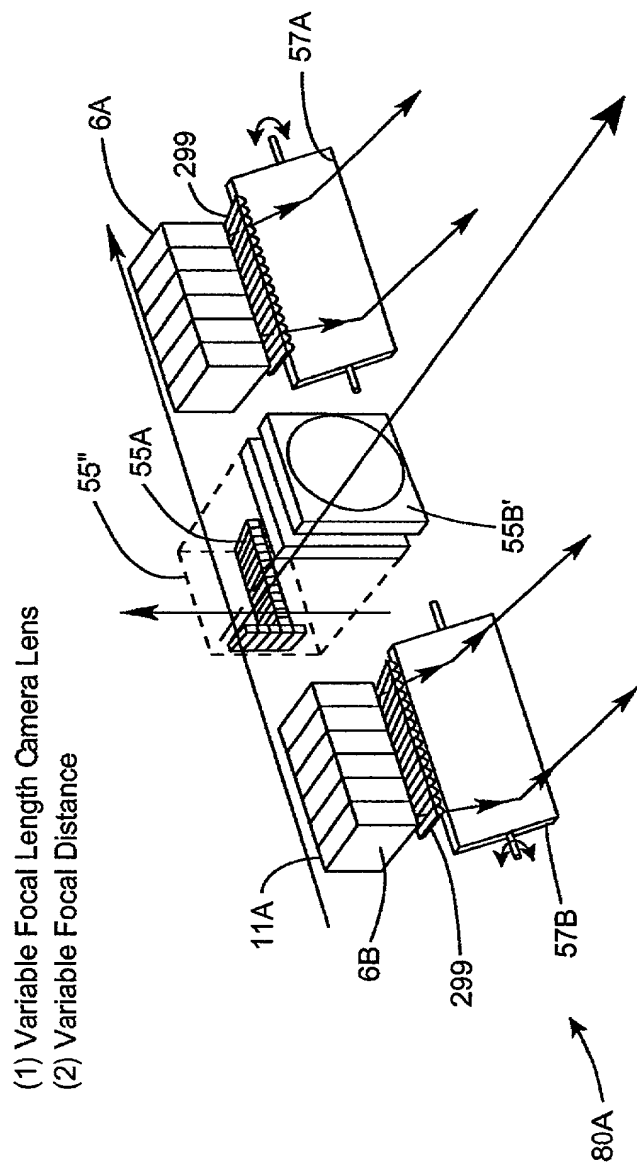


FIG. 6B2



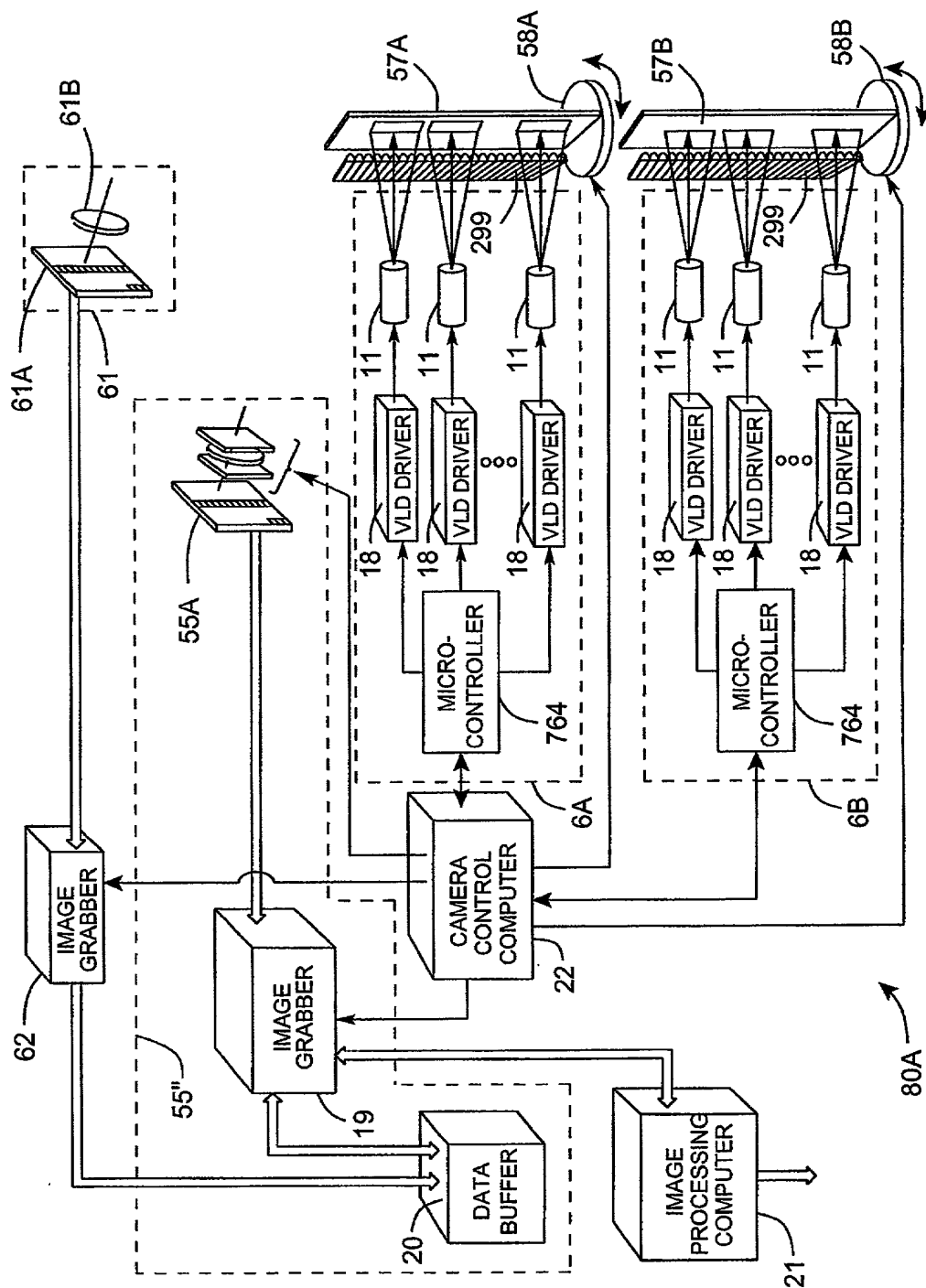


FIG. 6B3

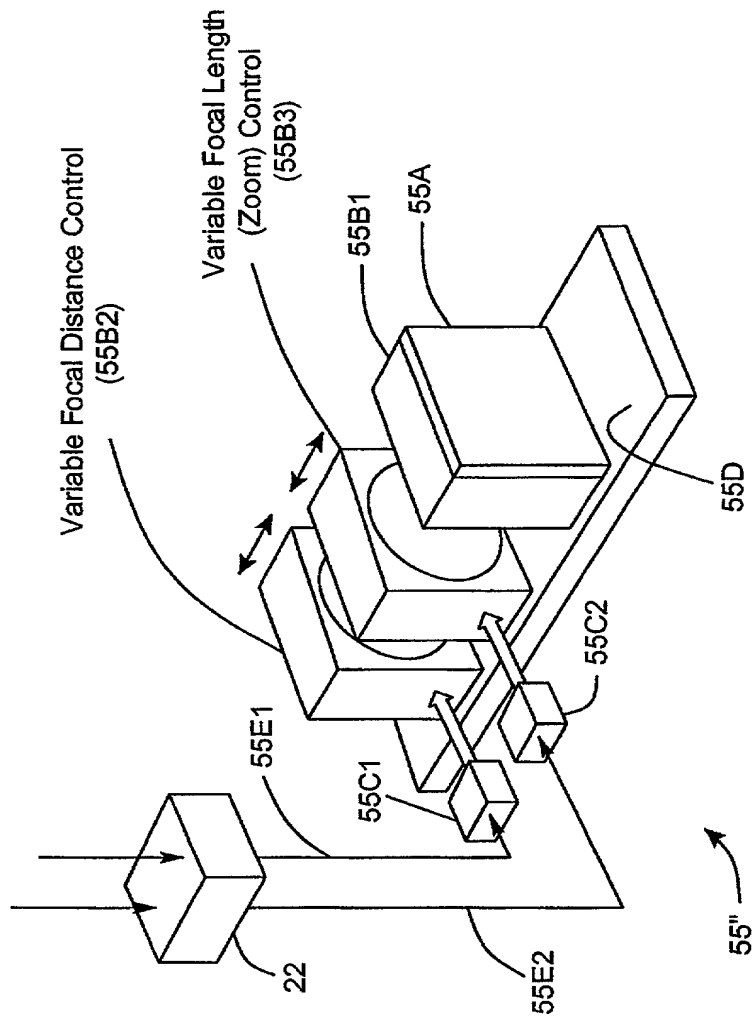


FIG. 6B4

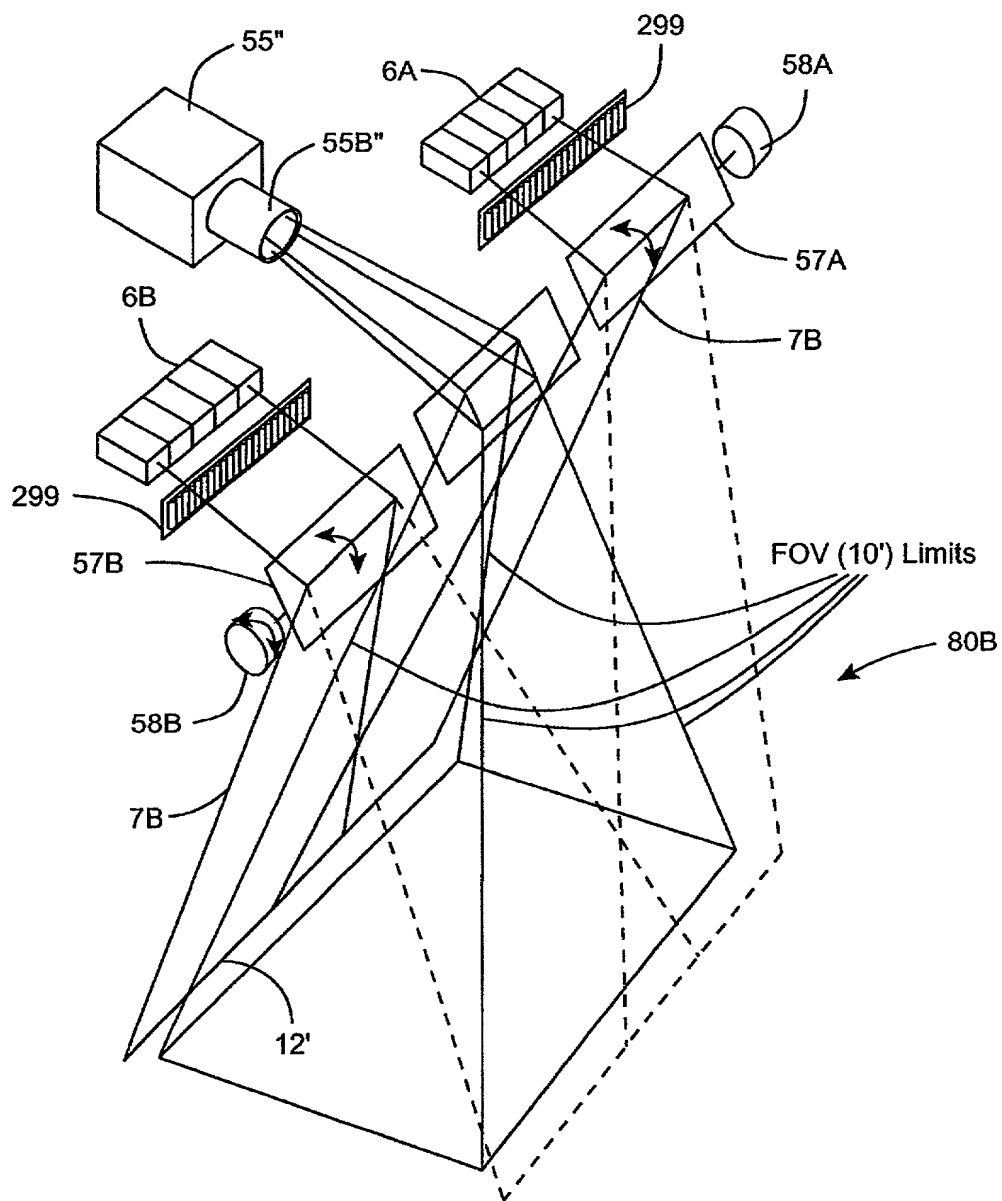


FIG. 6C1



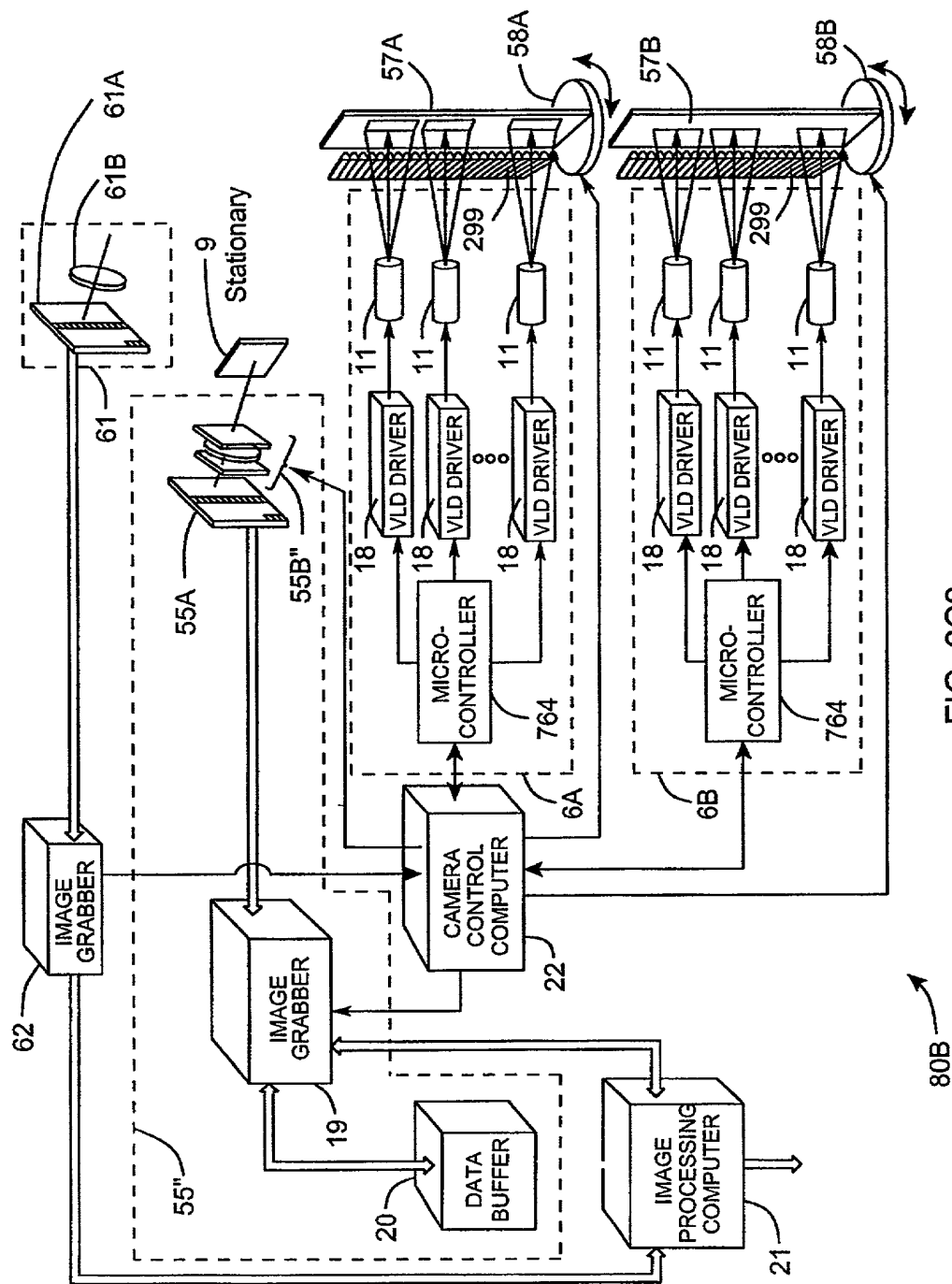


FIG. 6C3

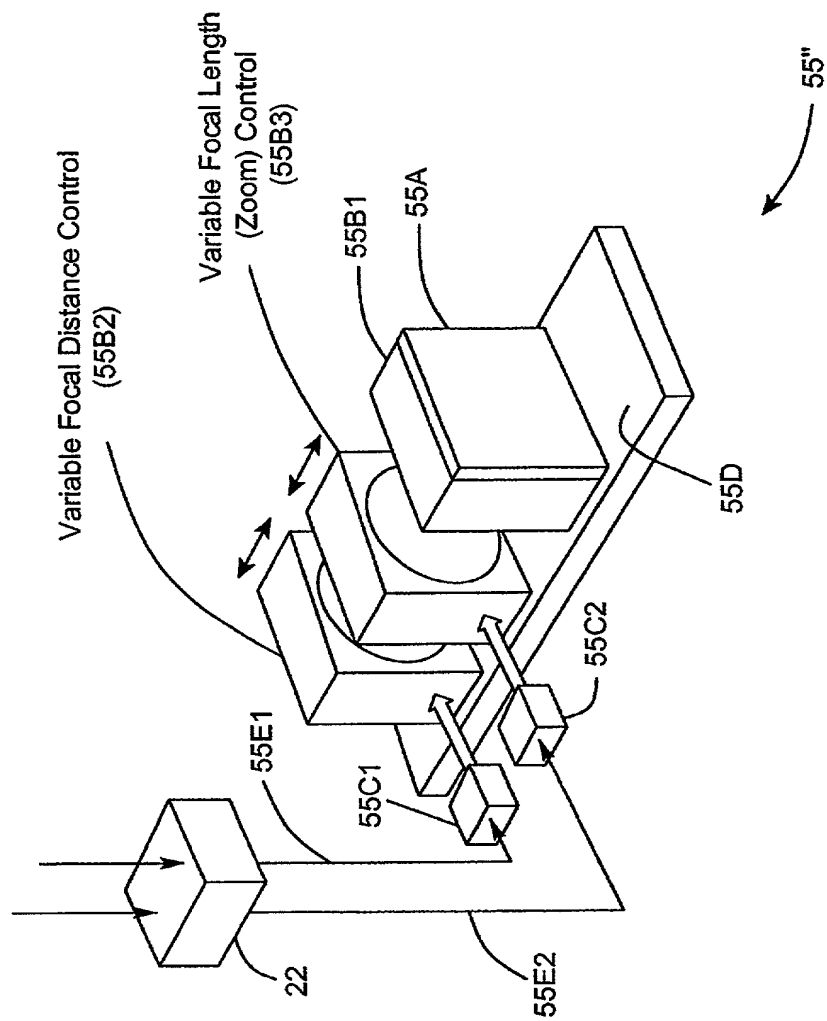


FIG. 6C4

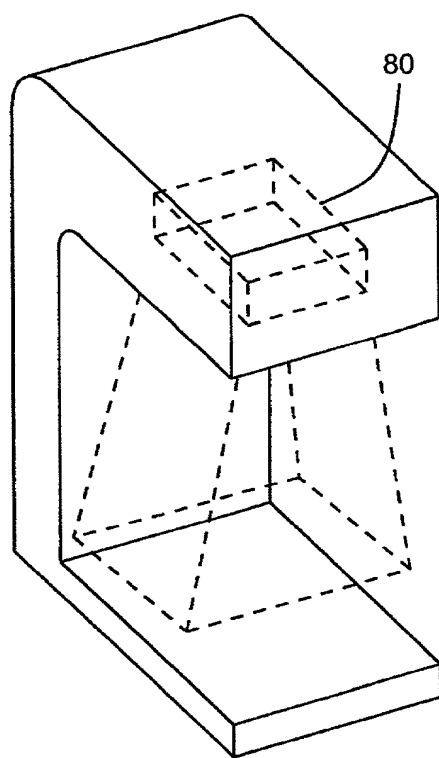


FIG. 6C5

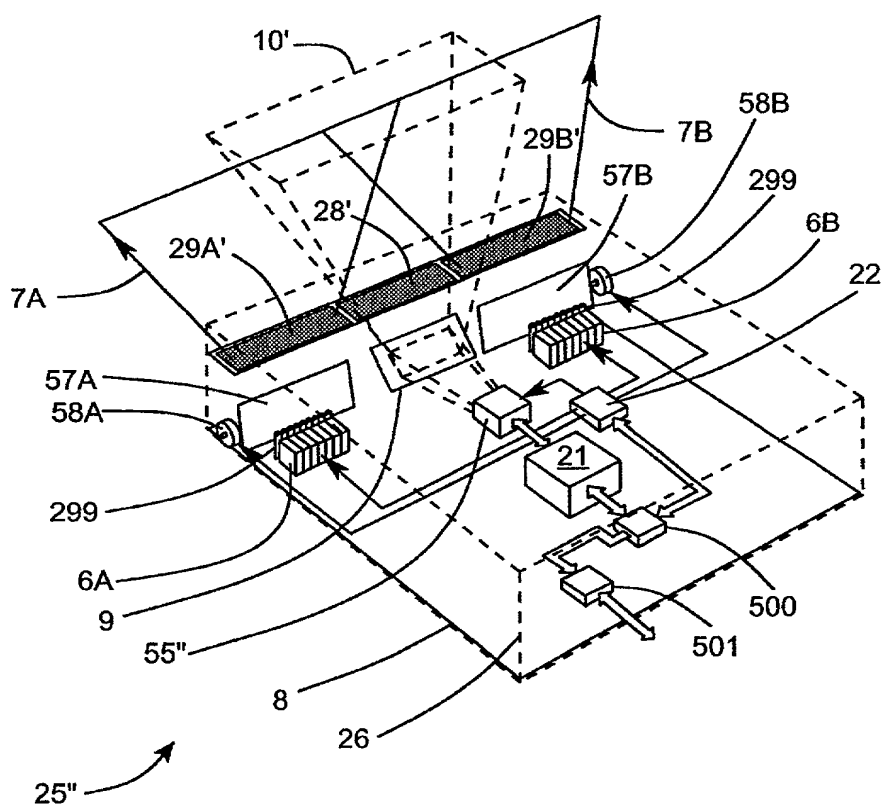
[illegible]

FIG. 6D1



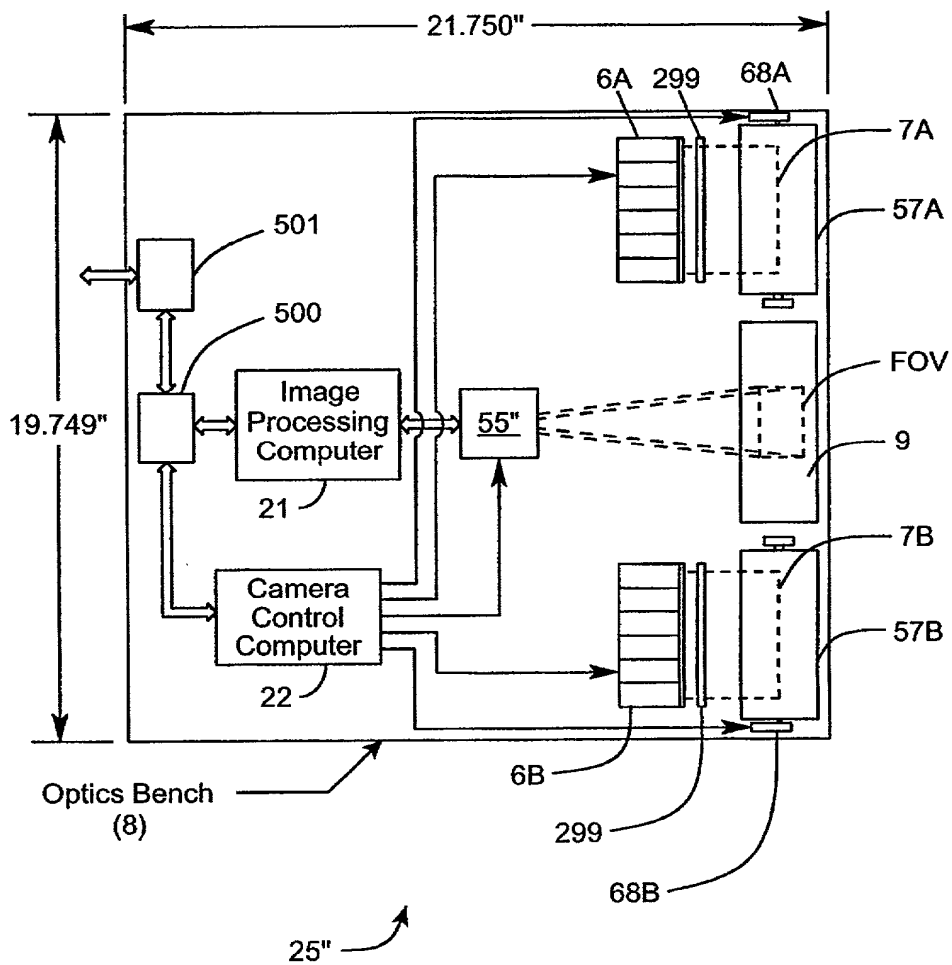


FIG. 6D2

[illegible]

FIG. 6D3

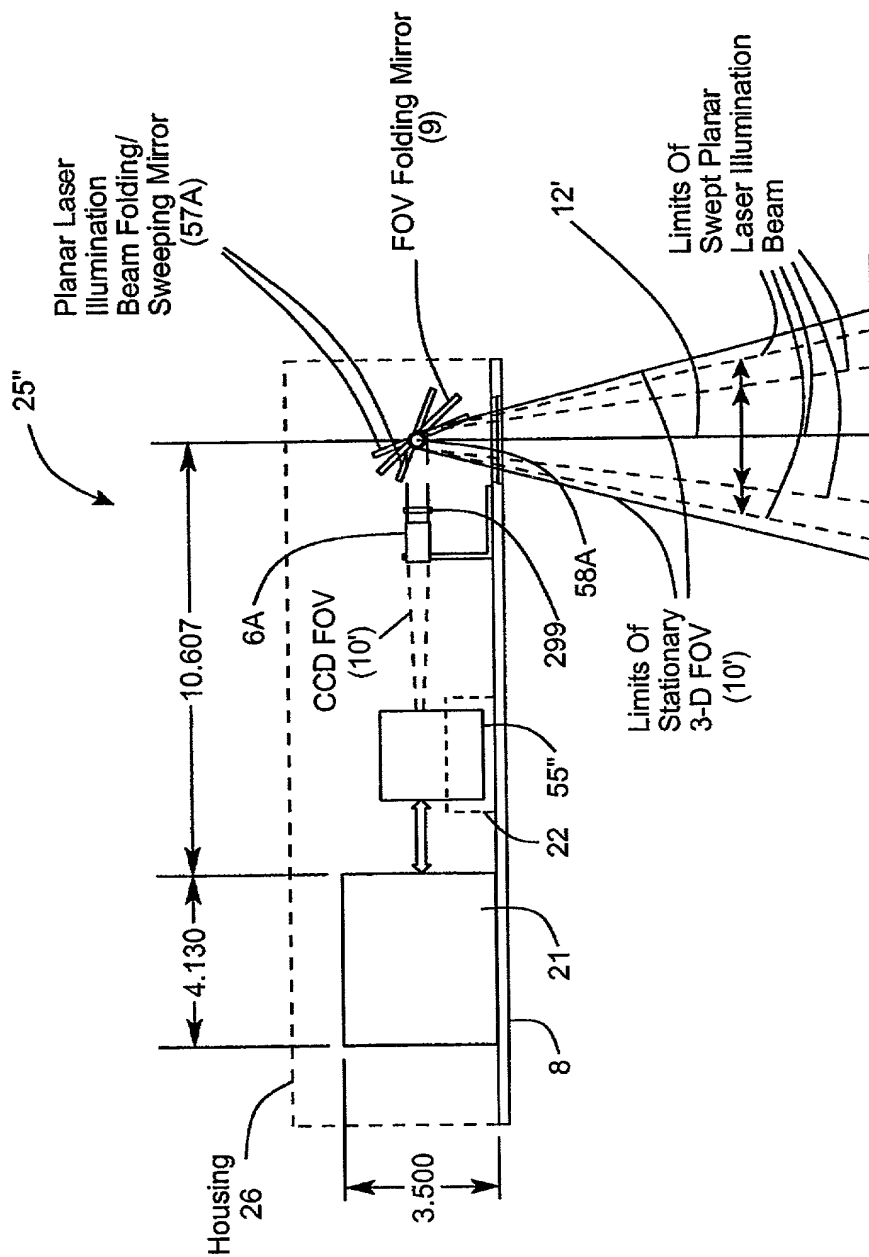


FIG. 6D4

\* Variable FOV

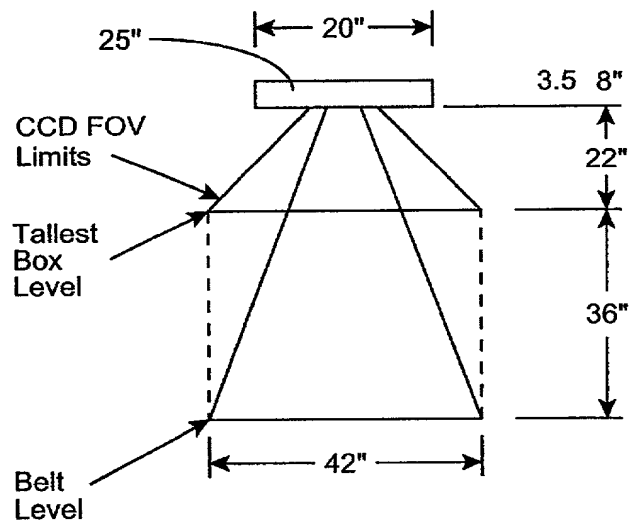


FIG. 6D5

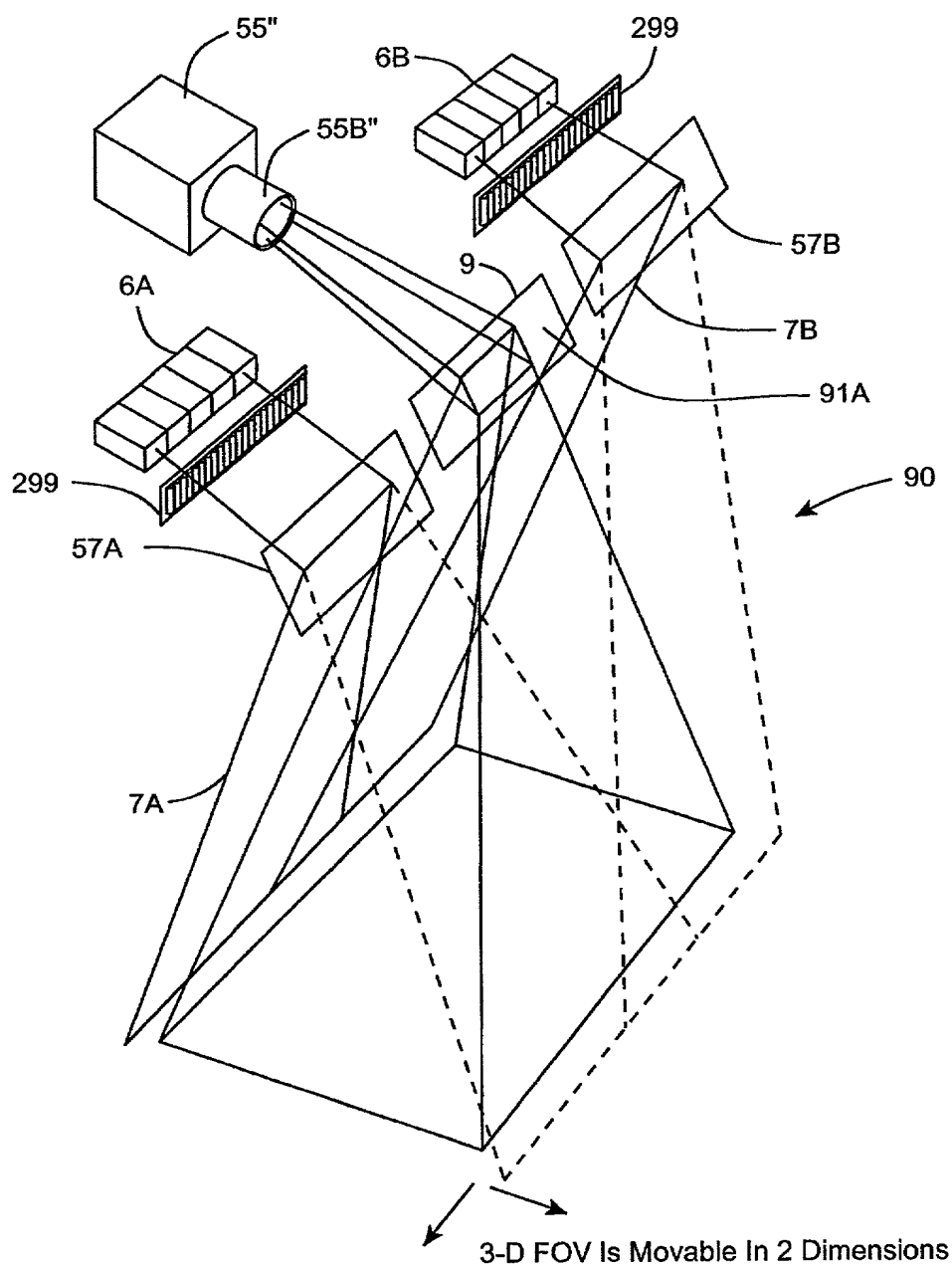


FIG. 6E1



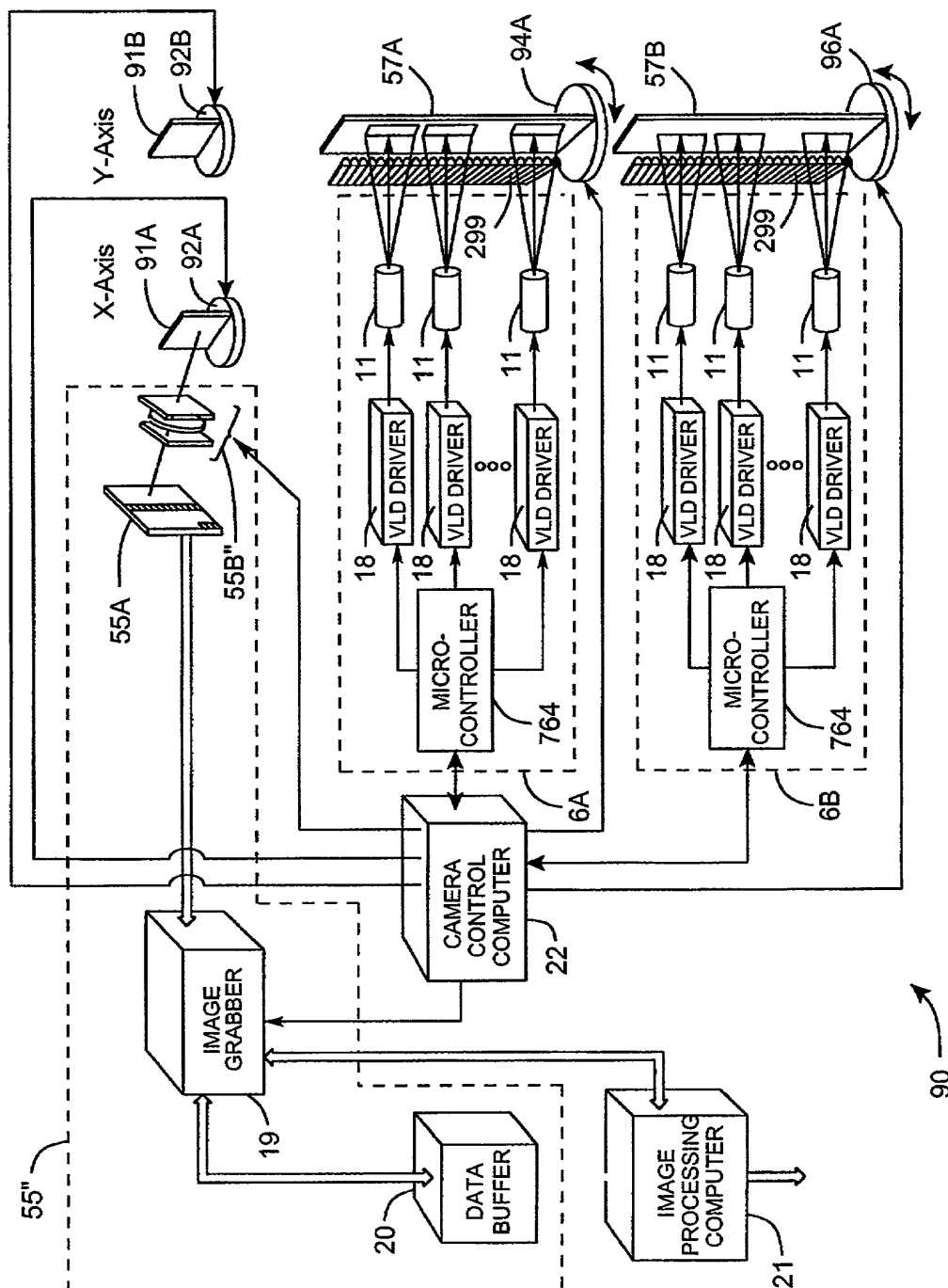


FIG. 6E3

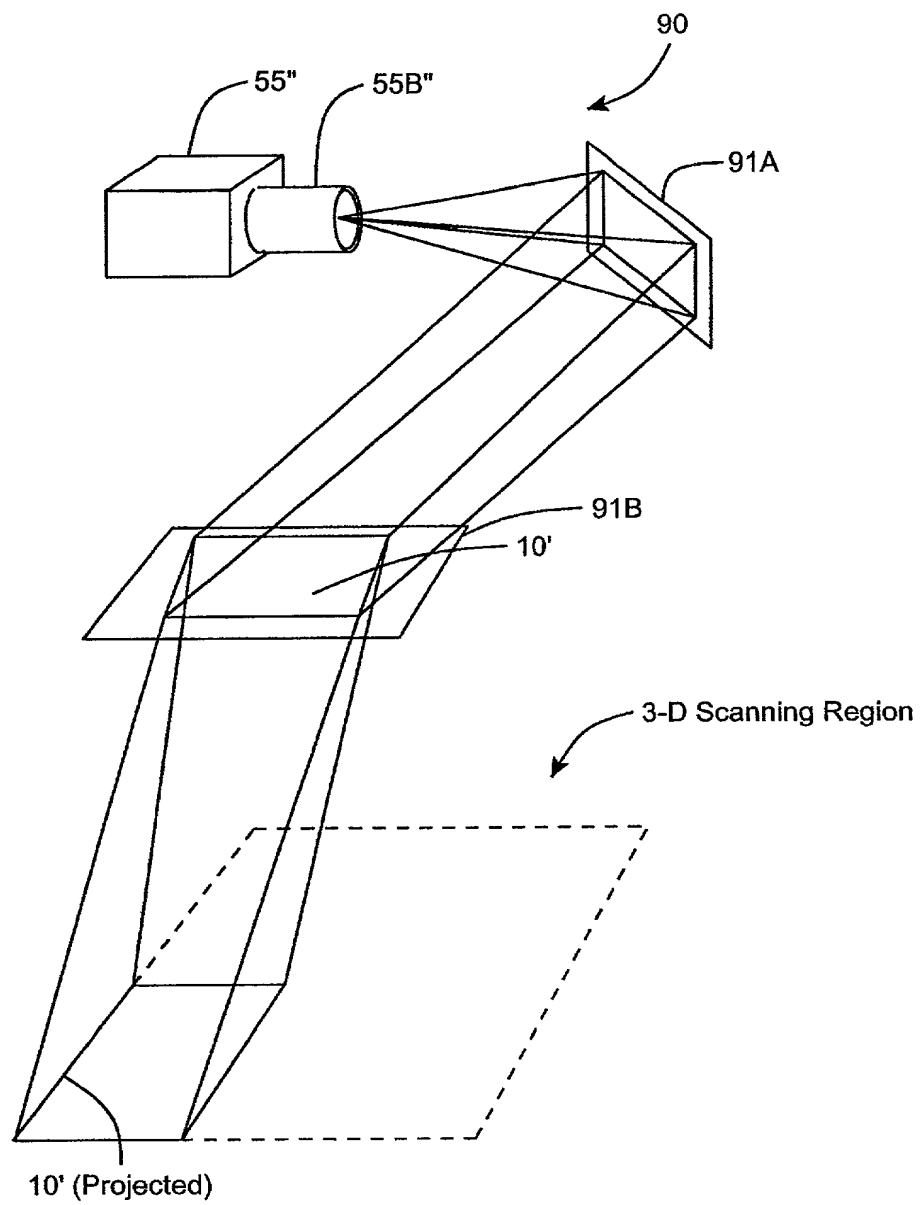


FIG. 6E4



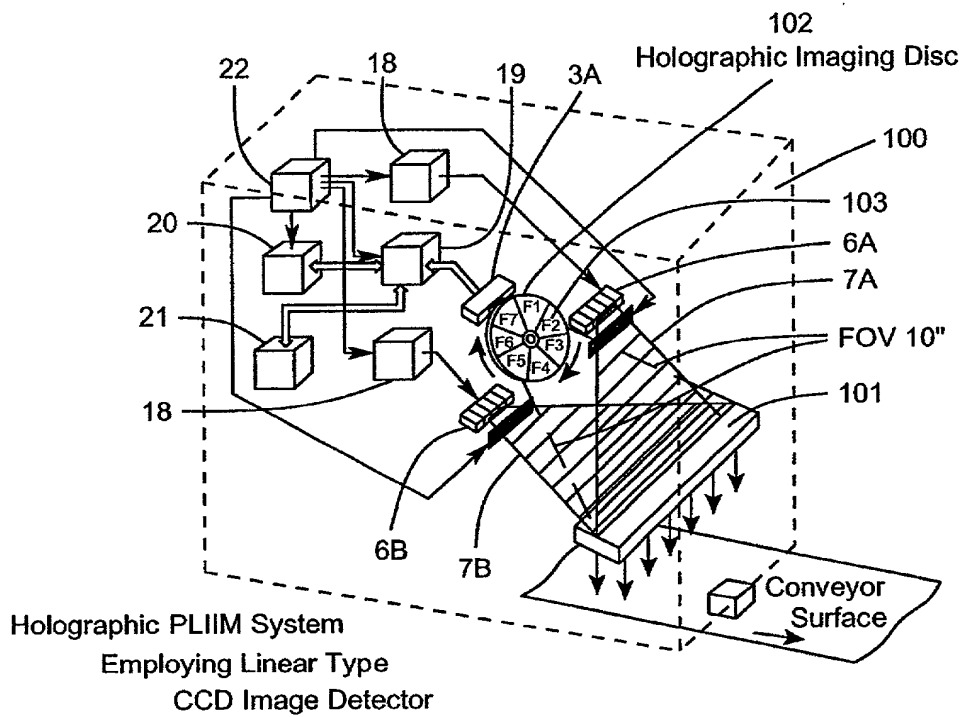


FIG. 7A

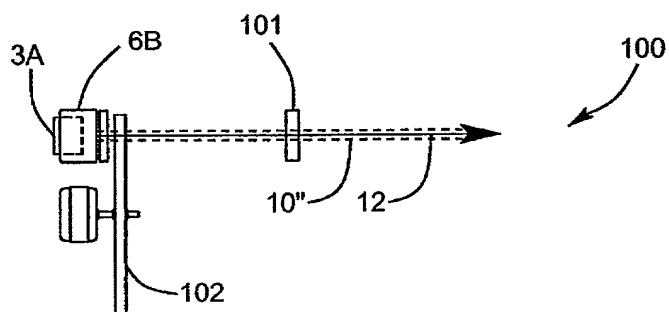


FIG. 7B

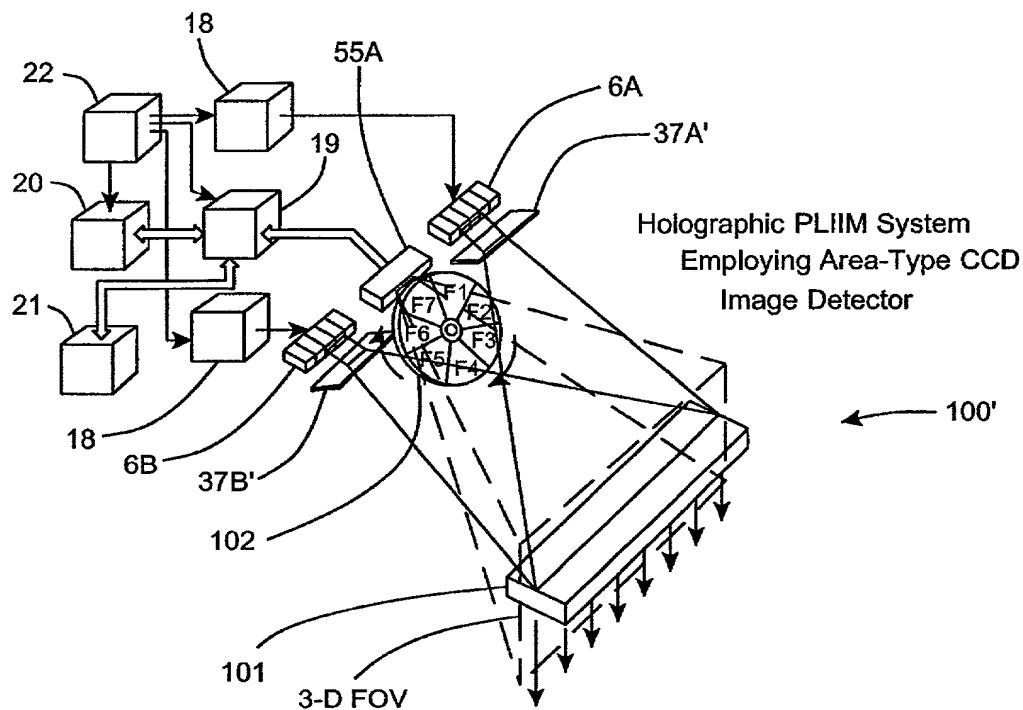


FIG. 8A

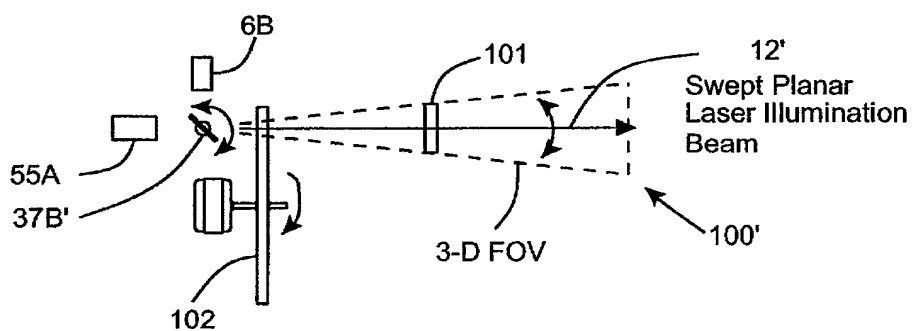


FIG. 8B

1-D Scanner Embodiment

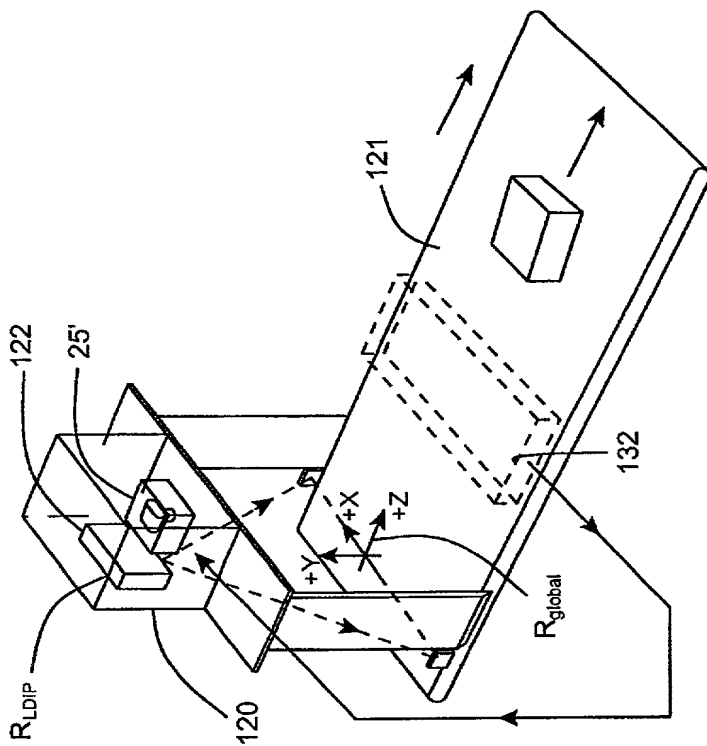


FIG. 9

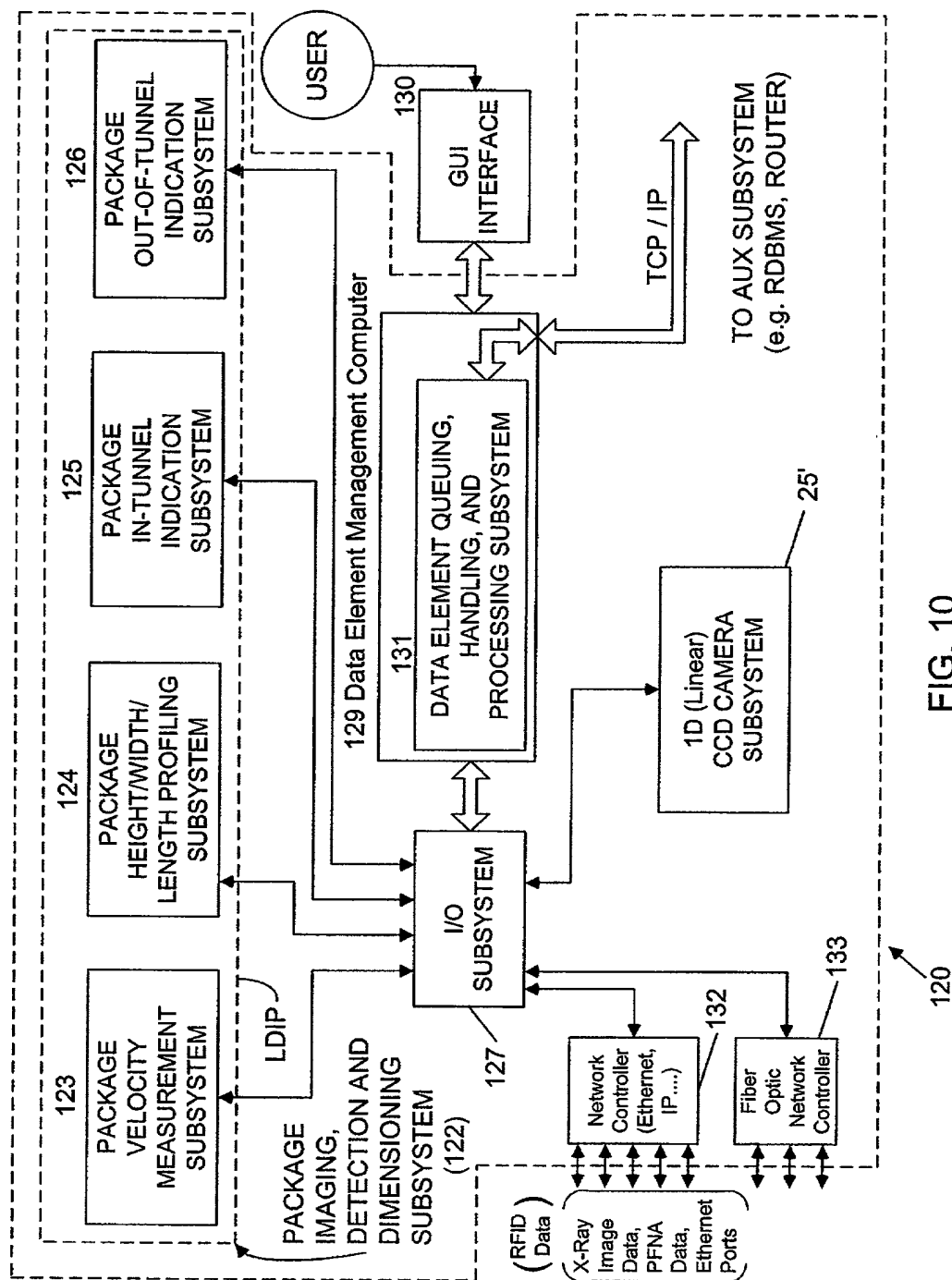


FIG. 10



[illegible]

FIG. 12A

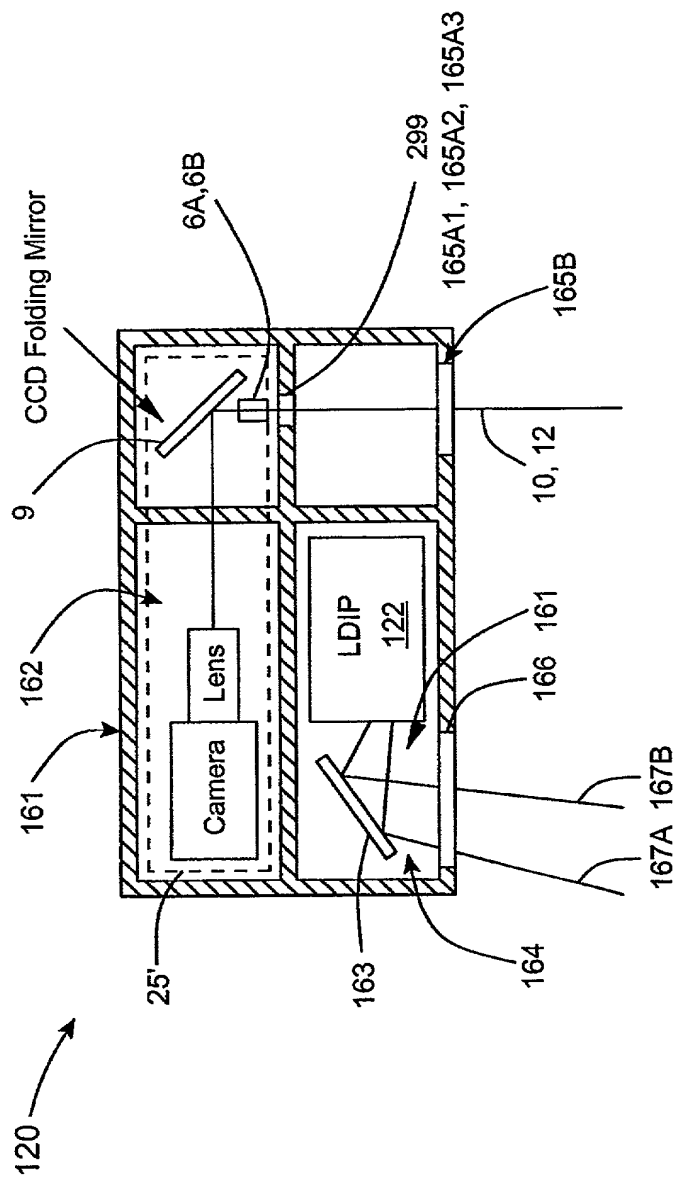


FIG. 12B

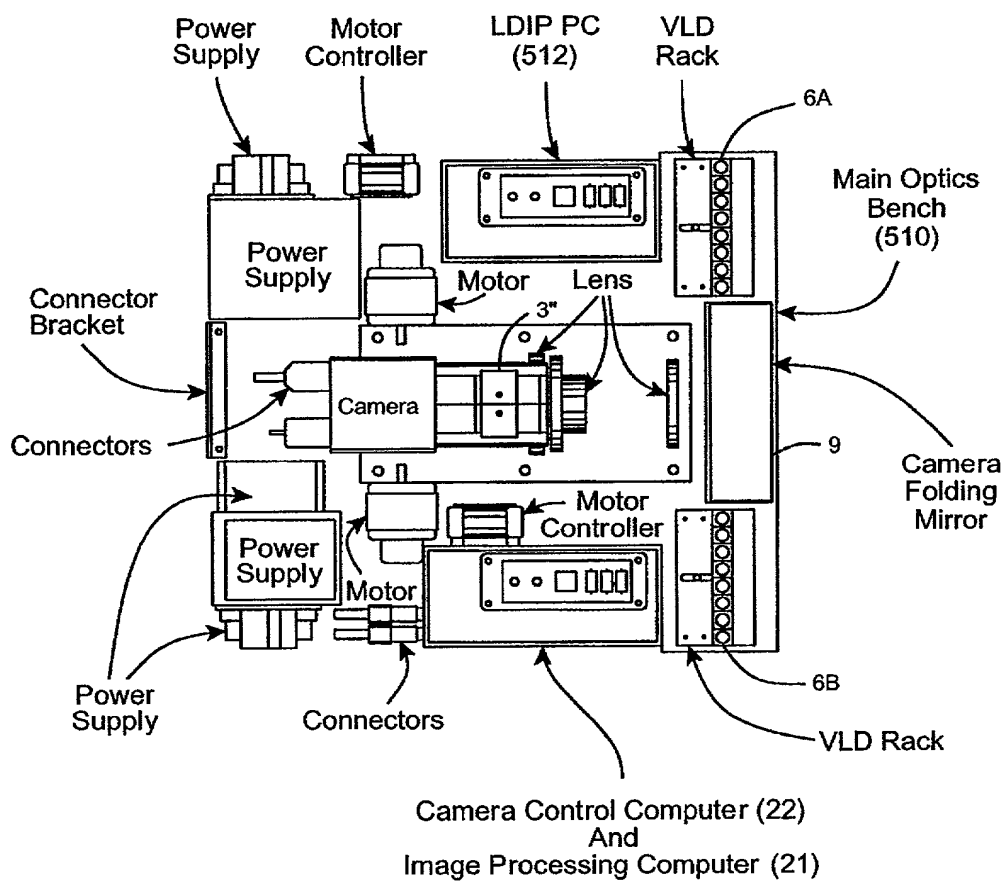


FIG. 12C



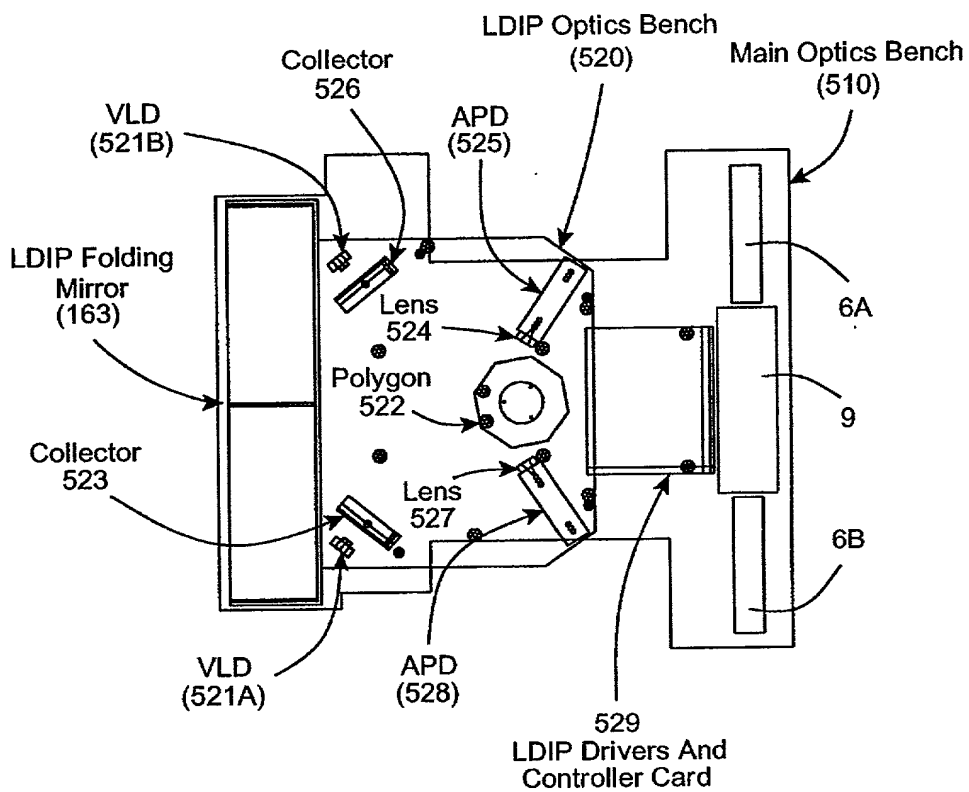
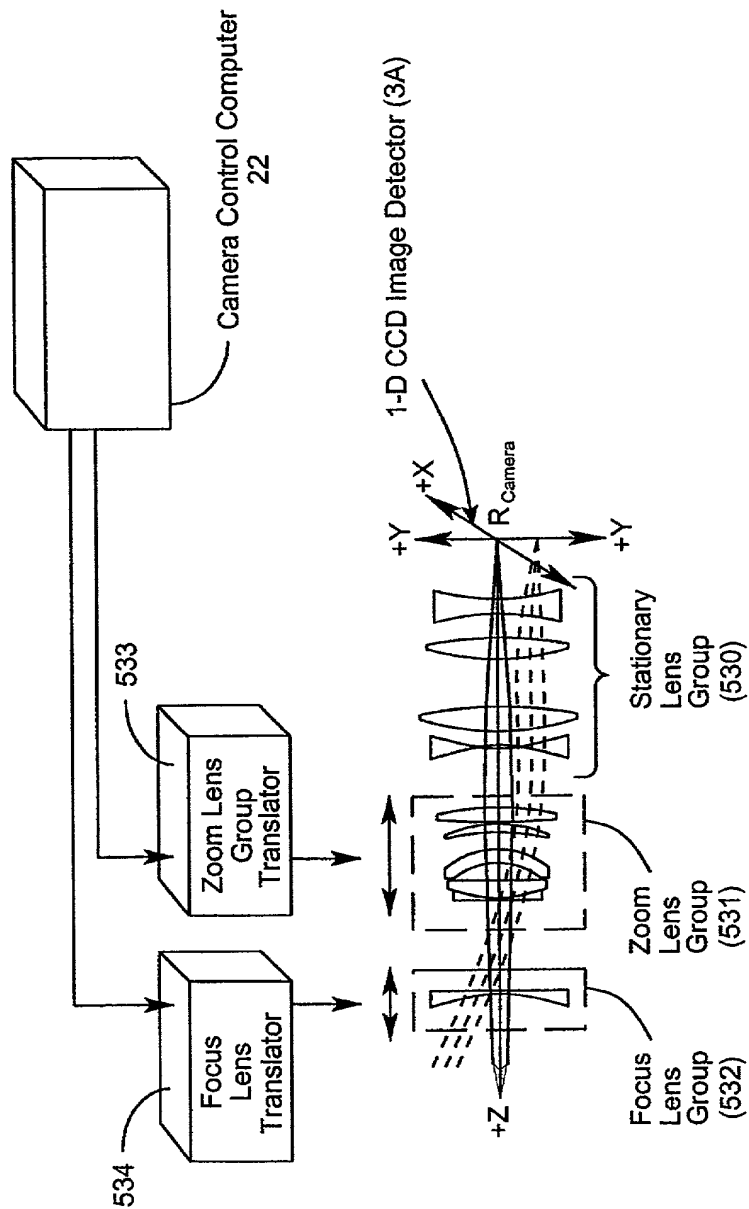


FIG. 12D



Main Optics Lens Groups

FIG. 12E

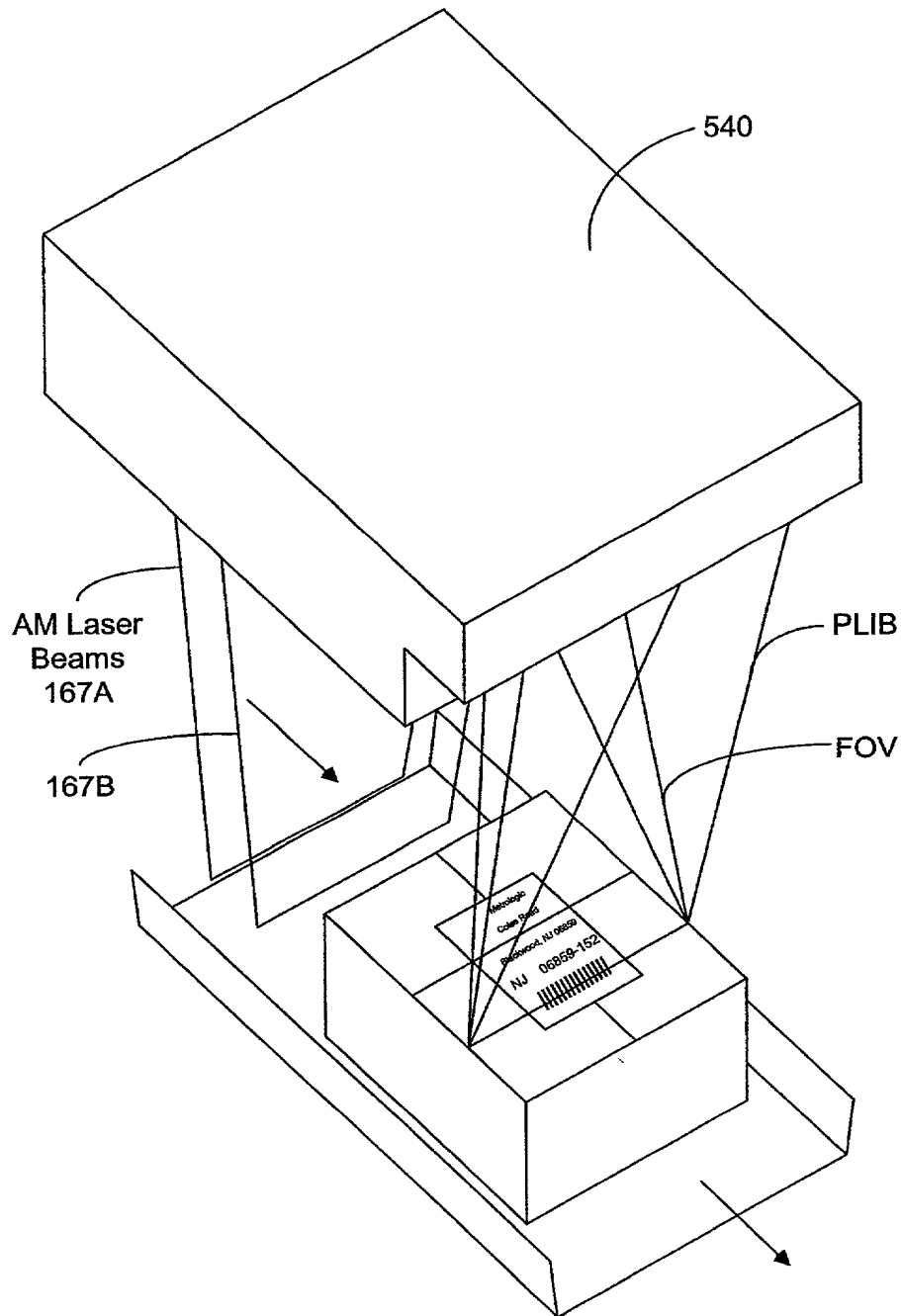


FIG. 13A

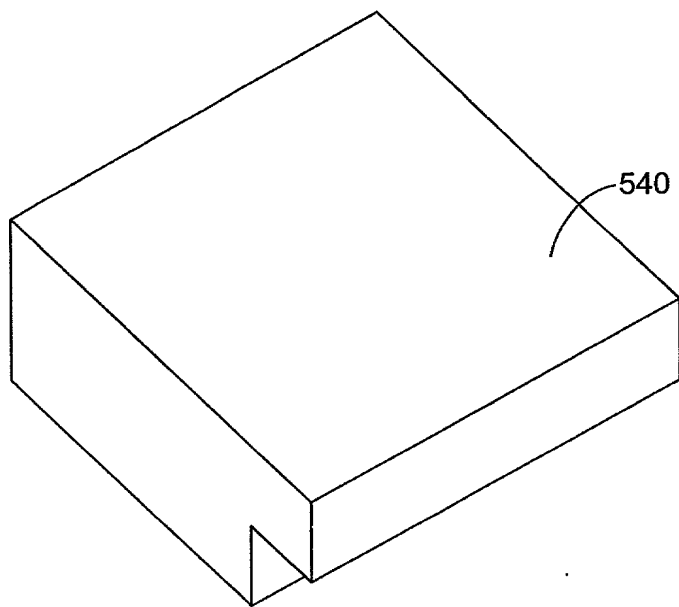


FIG. 13B

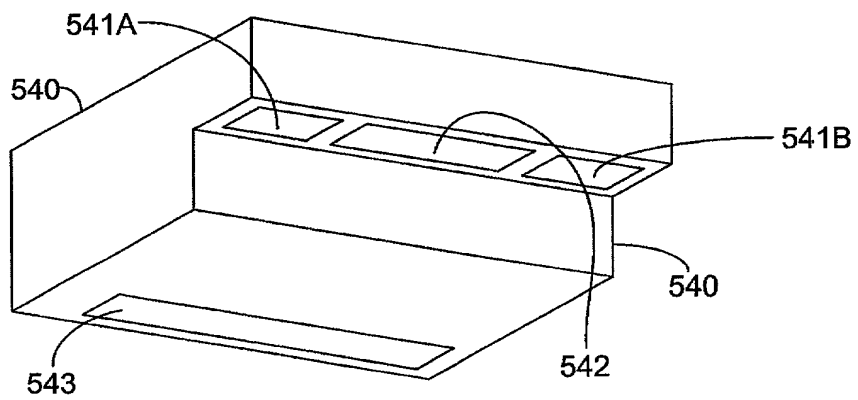


FIG. 13C

PLIIM-BASED PACKAGE IDENTIFICATION AND  
DIMENSIONING (PID) SYSTEM

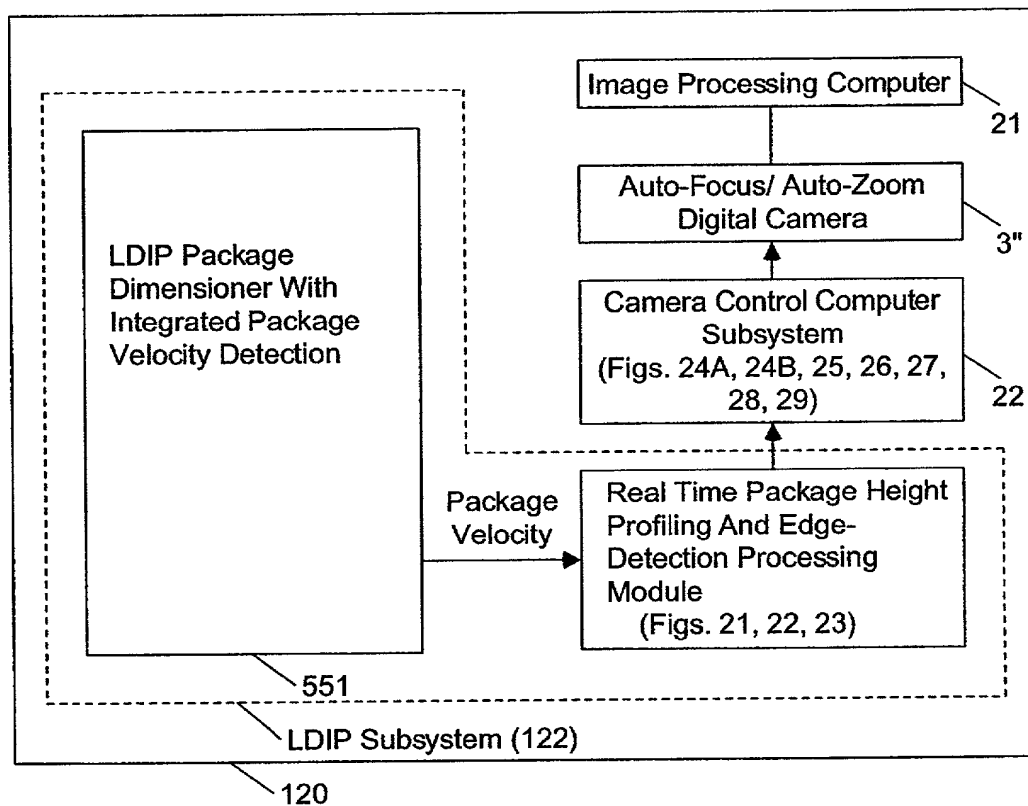


FIG. 14

# LDIP REAL-TIME PACKAGE HEIGHT PROFILE AND EDGE DETECTION METHOD

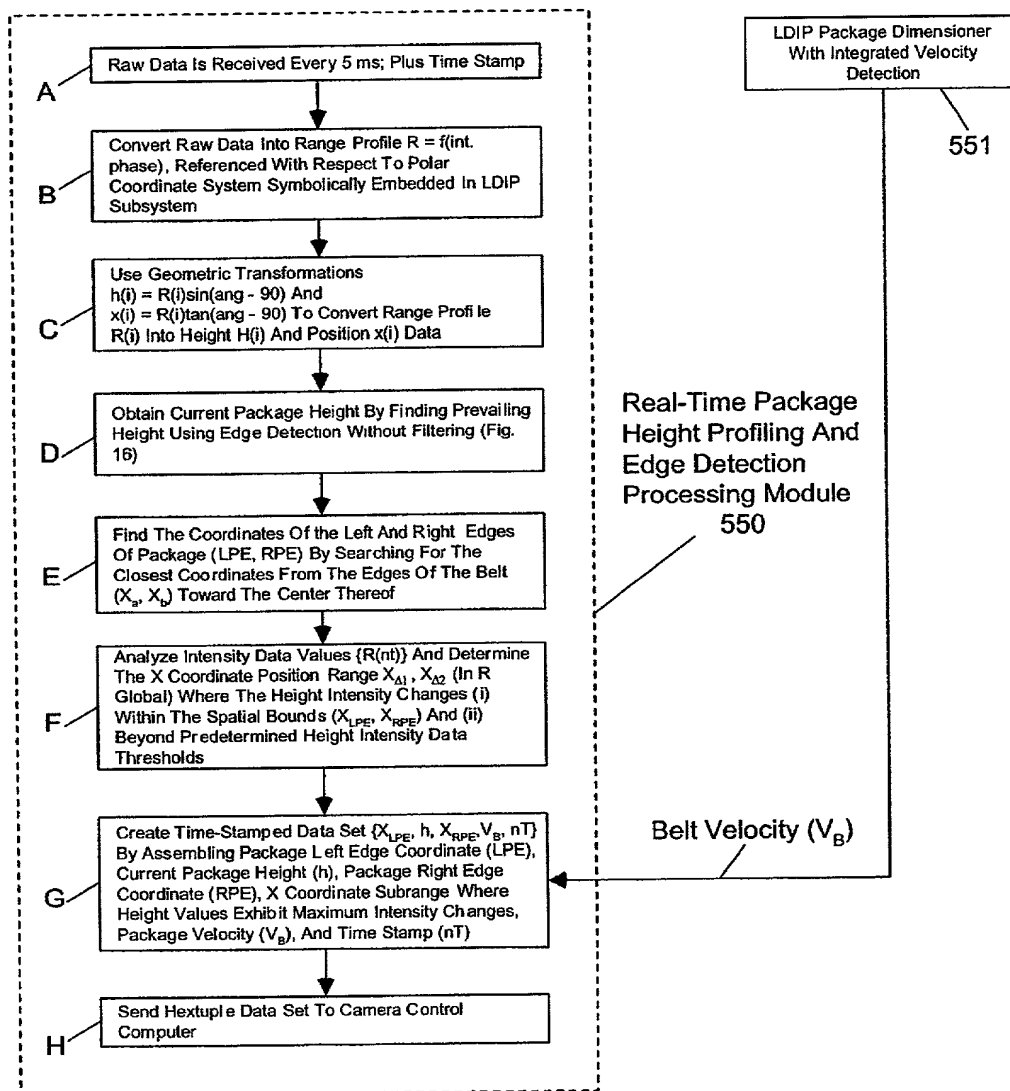


FIG. 15

# LDIP REAL-TIME PACKAGE EDGE DETECTION

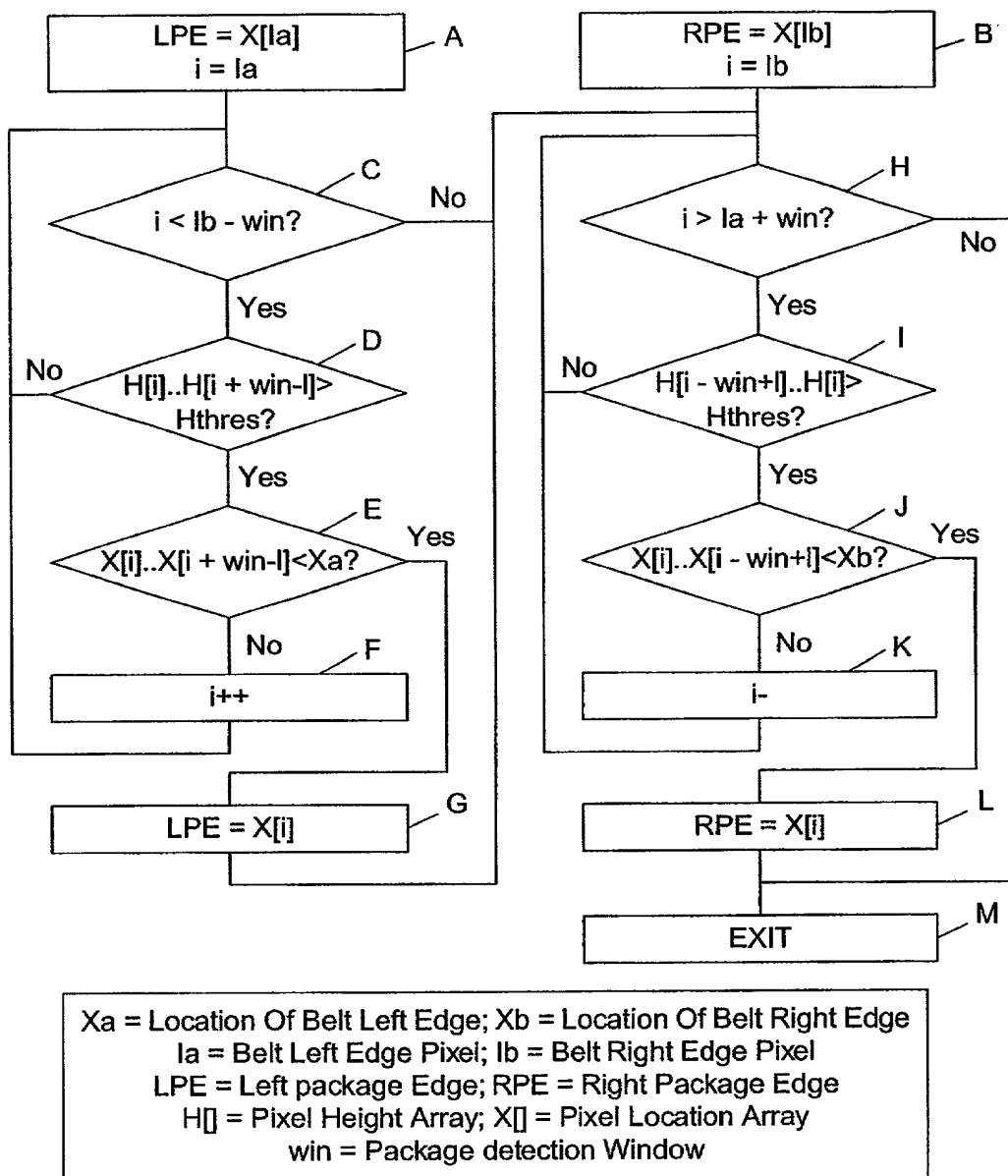


FIG. 16

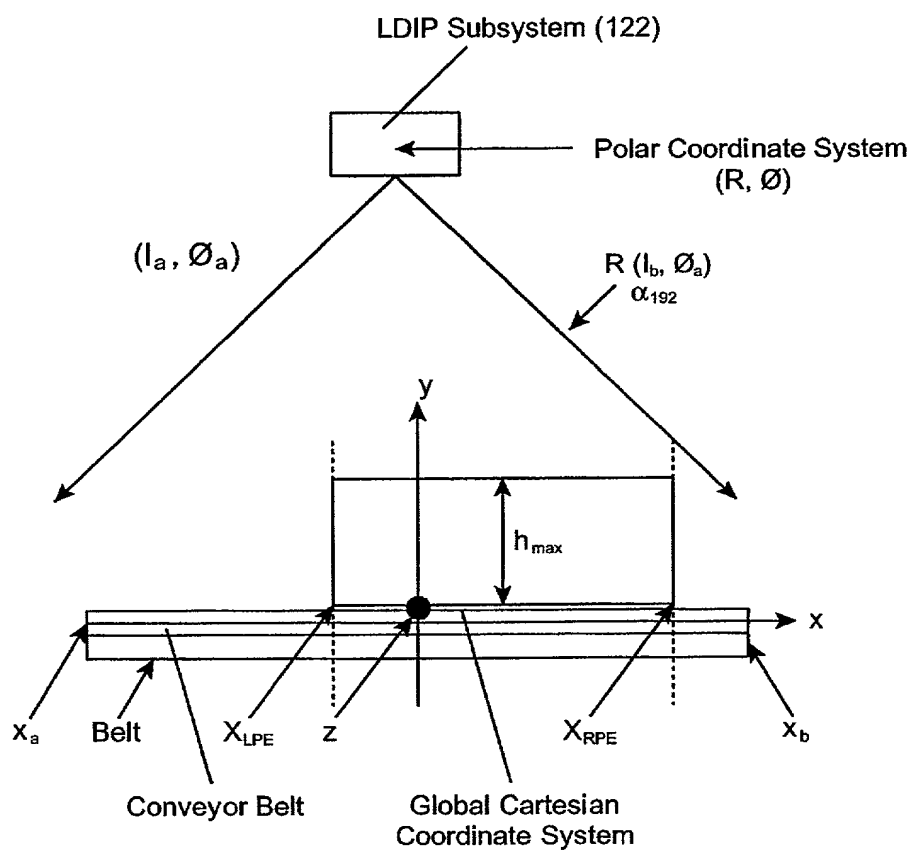


FIG. 17



### Information Measured At Scan Angles Before Coordinate Transformations

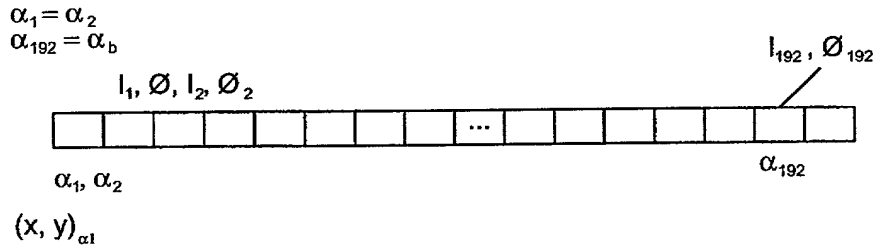


FIG. 17A

### Range And Polar Angle Measures Taken At Scan Angle $\alpha$ Before Coordinate Transforms

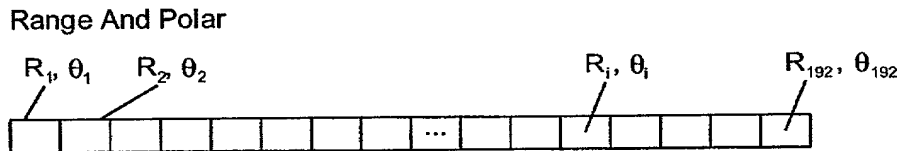


FIG. 17B

### Measured Package Height And Position Values After Coordinate Transforms

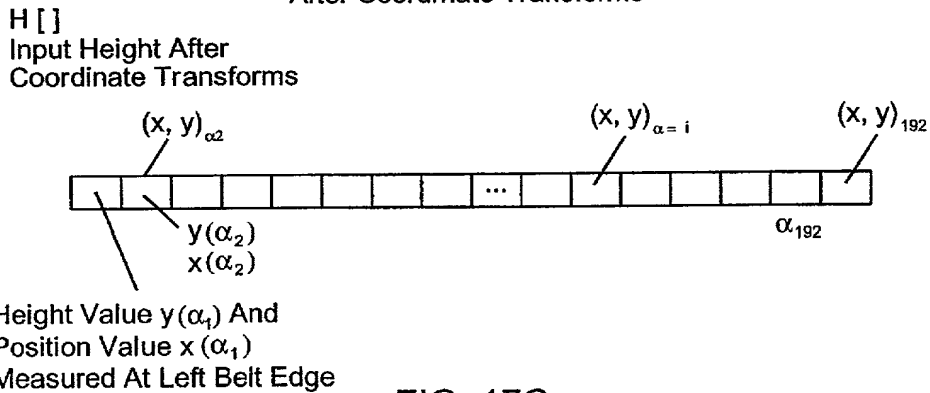


FIG. 17C

**CAMERA CONTROL PROCESS CARRIED OUT WITHIN THE CAMERA  
CONTROL SUBSYSTEM OF EACH OBJECT IDENTIFICATION AND  
ATTRIBUTE ACQUISITION SYSTEM OF PRESENT INVENTION**

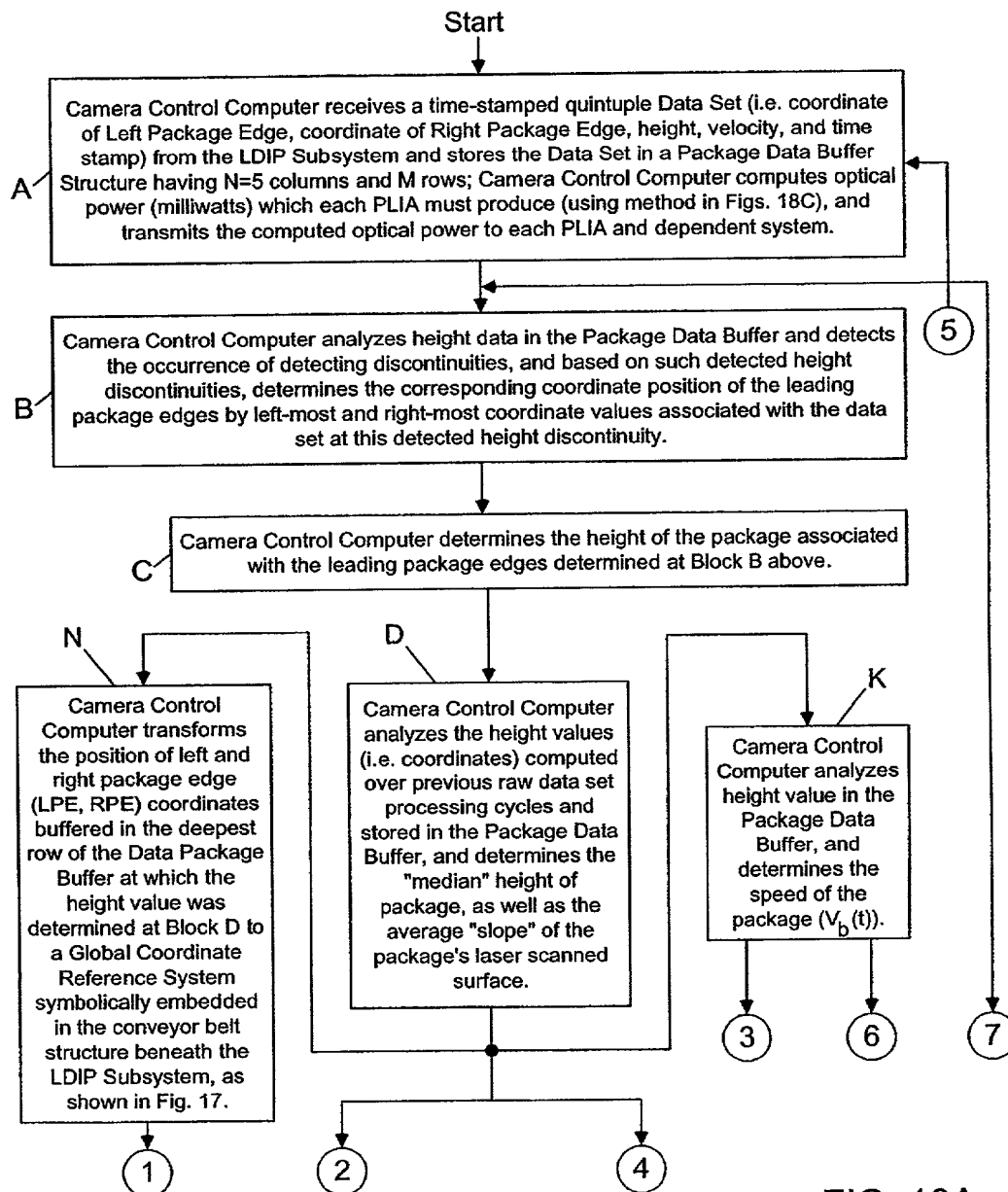


FIG. 18A

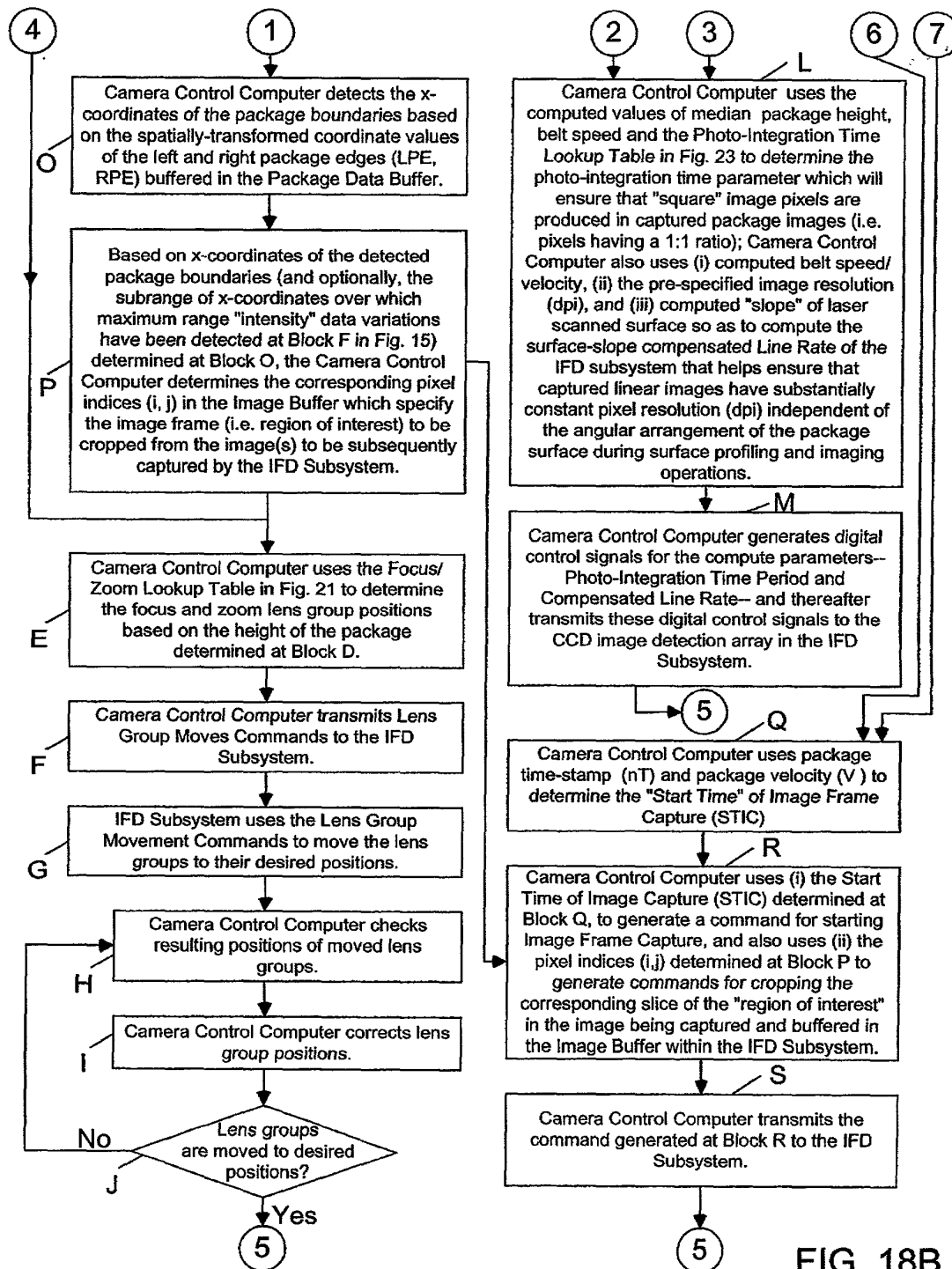


FIG. 18B

METHOD OF COMPUTING OPTICAL OUTPUT POWER FROM LASER  
DIODES IN A PLANAR LASER ILLUMINATION ARRAY (PLIA) FOR  
CONTROLLING THE CONSTANT WHITE-LEVEL IN IMAGE PIXELS  
CAPTURED BY A PLIIM-BASED LINEAR IMAGER

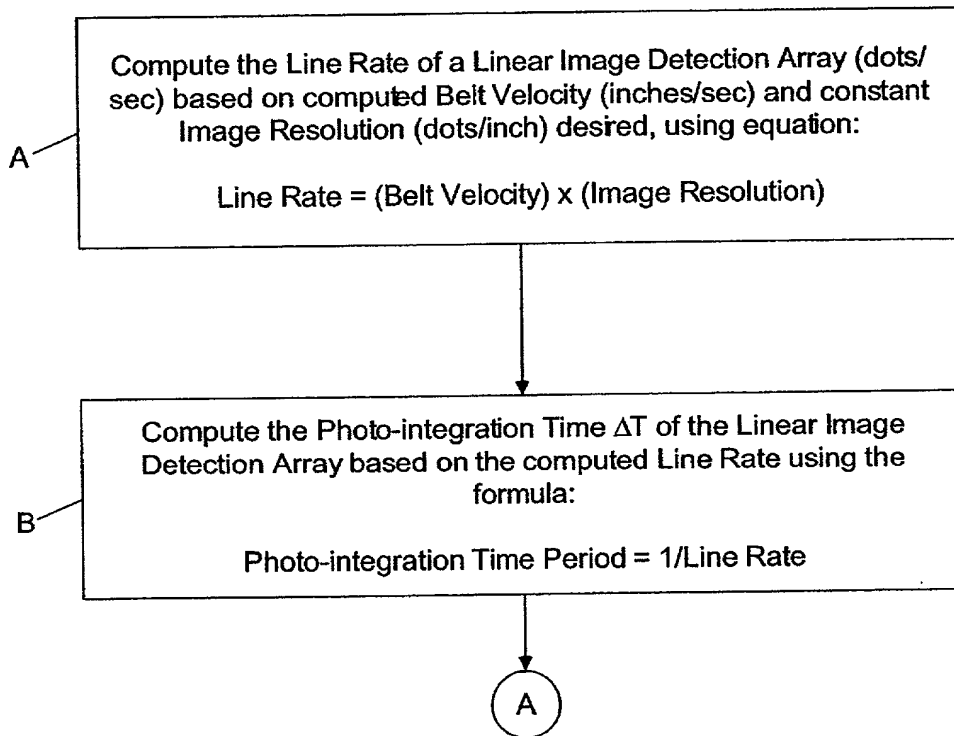


FIG. 18C1

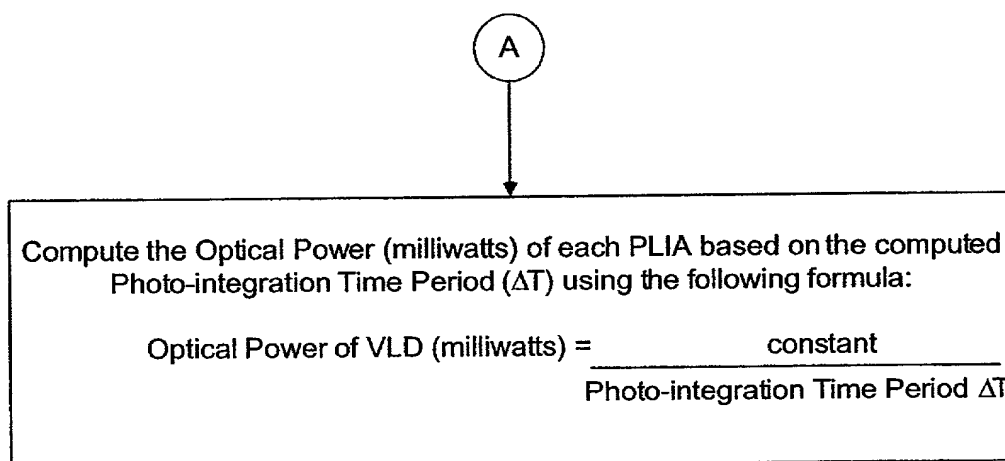


FIG. 18C2

[illegible]

Left Package Edge (LPE)	Package Height (h)	Right Package Edge (RPE)	Package Velocity	Time-Stamp (nT)	
					Row 1
					Row 2
					Row 3
					Row 4
					Row 5
					Row M

FIG. 19

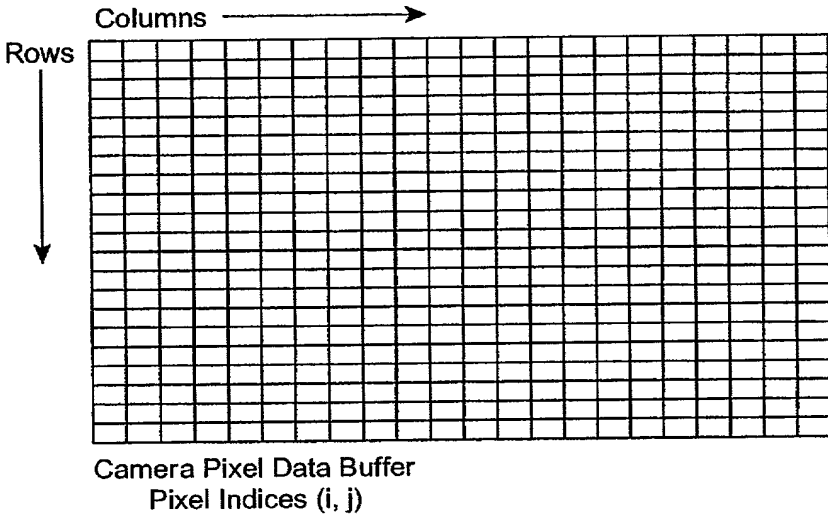


FIG. 20

Zoom And Focus Lens Group Position  
Look-Up Table

Distance From Camera H (mm)	Zoom Group Distance (mm) Y (Zoom)	Focus Group Distance (mm) Y (Focus)
1000	21.57489228	2.47E-05
1100	19.38089696	10.99009783
1200	17.10673434	20.65783177
1300	14.77137314	29.10917002
1400	12.39153565	36.47312595
1500	9.979114358	42.87845436
1600	7.540639114	48.44003358
1700	5.078794775	53.25495831
1800	2.595989366	57.40834303
1900	0.099972739	60.98883615
(Use Interpolation Techniques For Working Distances Between Listed Points In Table)		

FIG. 21

\* Note: The focal distance and zoom (eff. focal length) of camera lens are coupled (inter-dependant) in this commercial embodiment.

Camera Has A Fixed Aperture F56

# Focus And Zoom Lens Movement vs. Working Distances

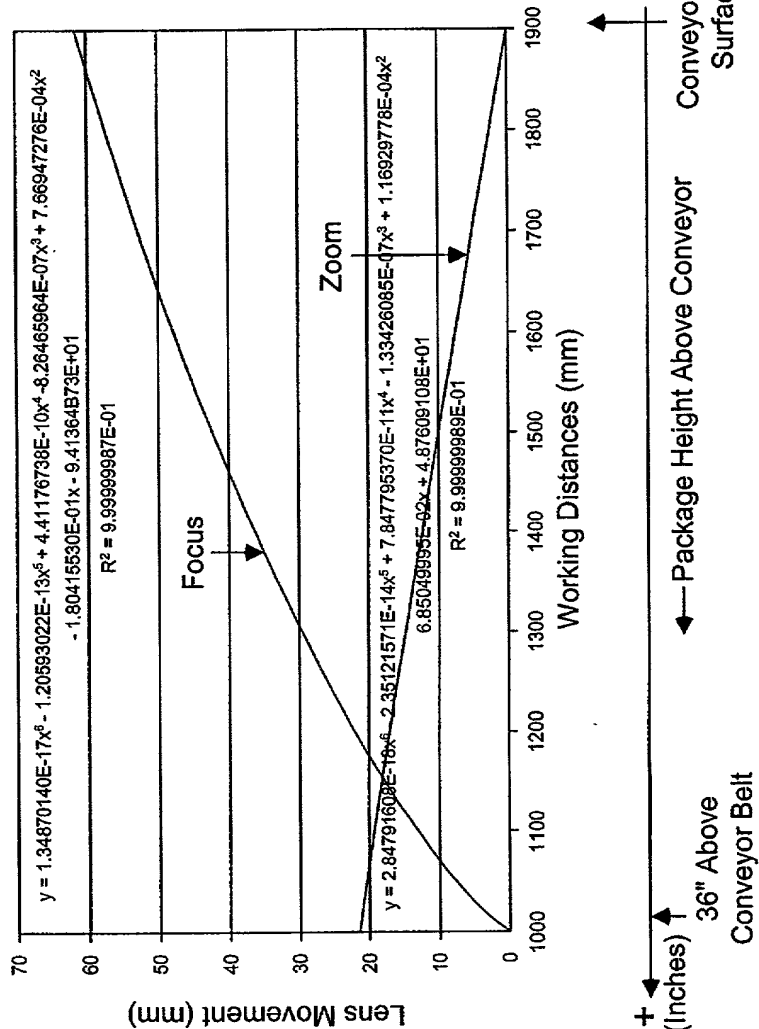
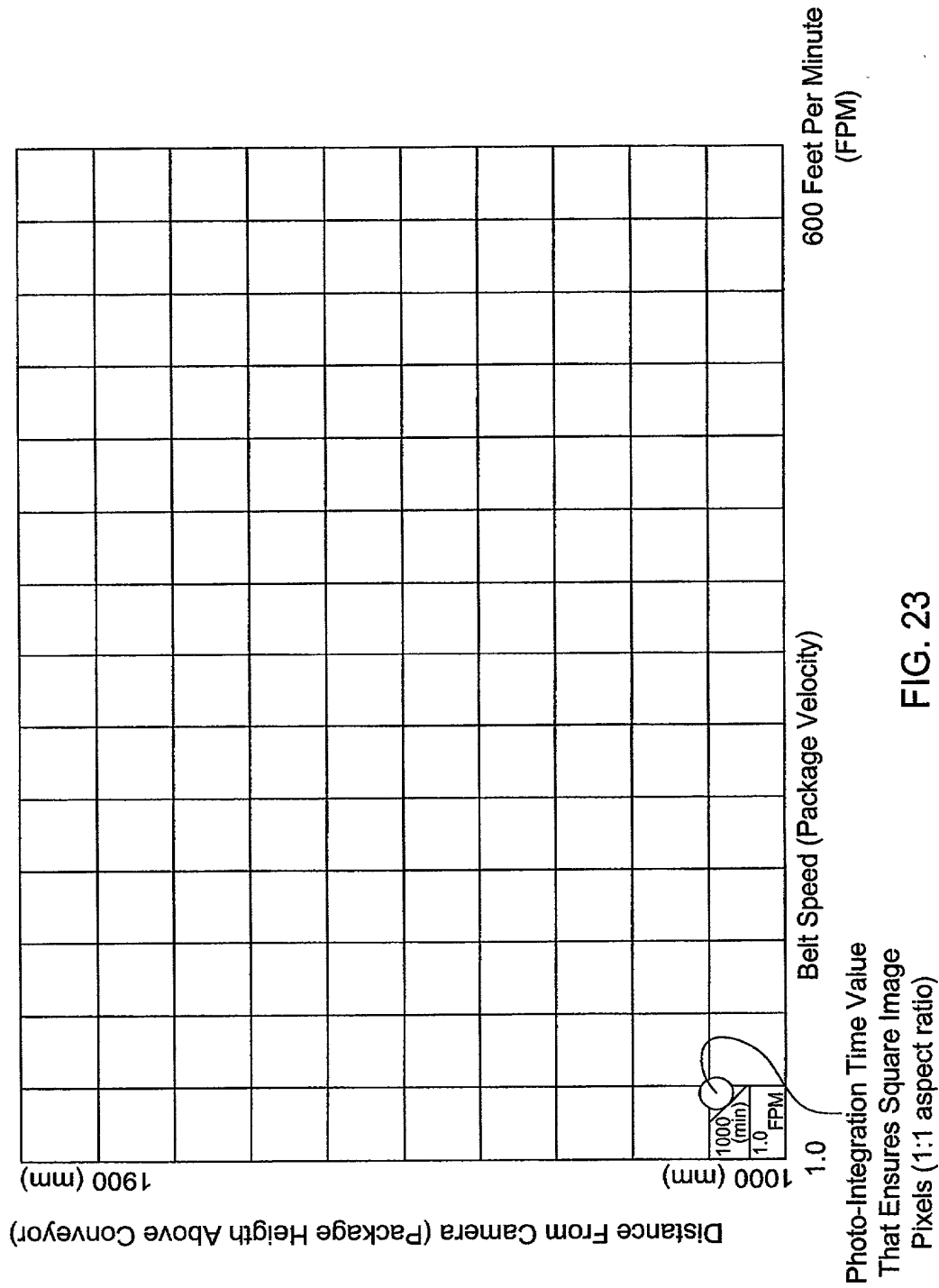


FIG. 22



### Photo-Integration Time Look-Up Table



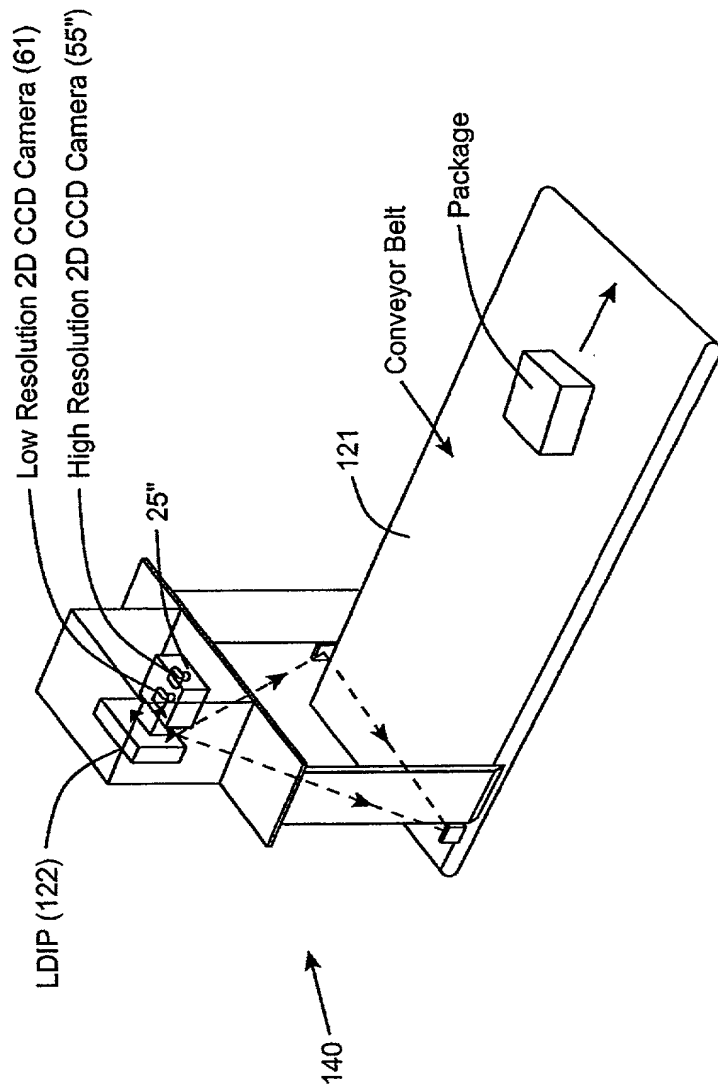


FIG. 24

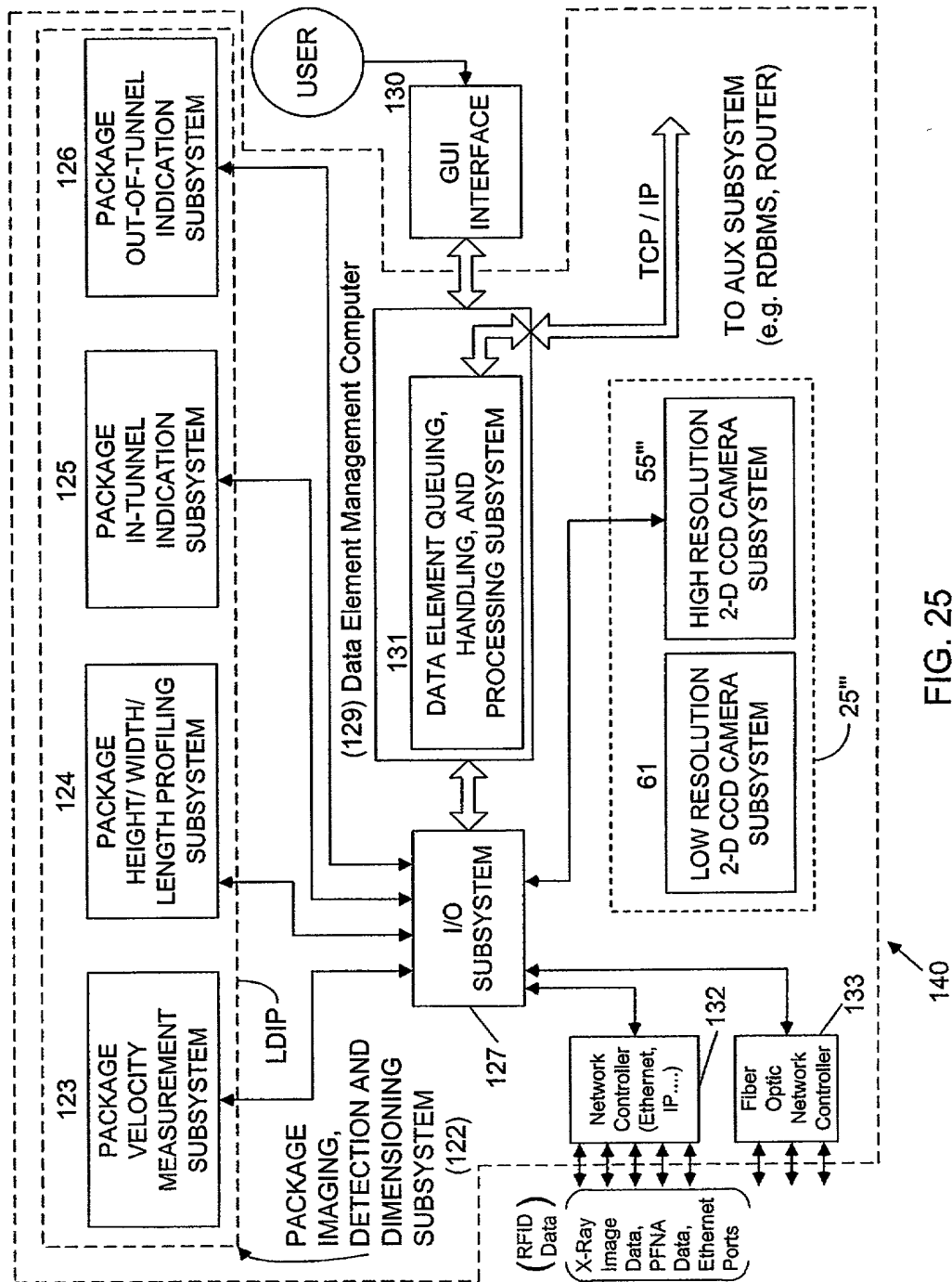


FIG. 25

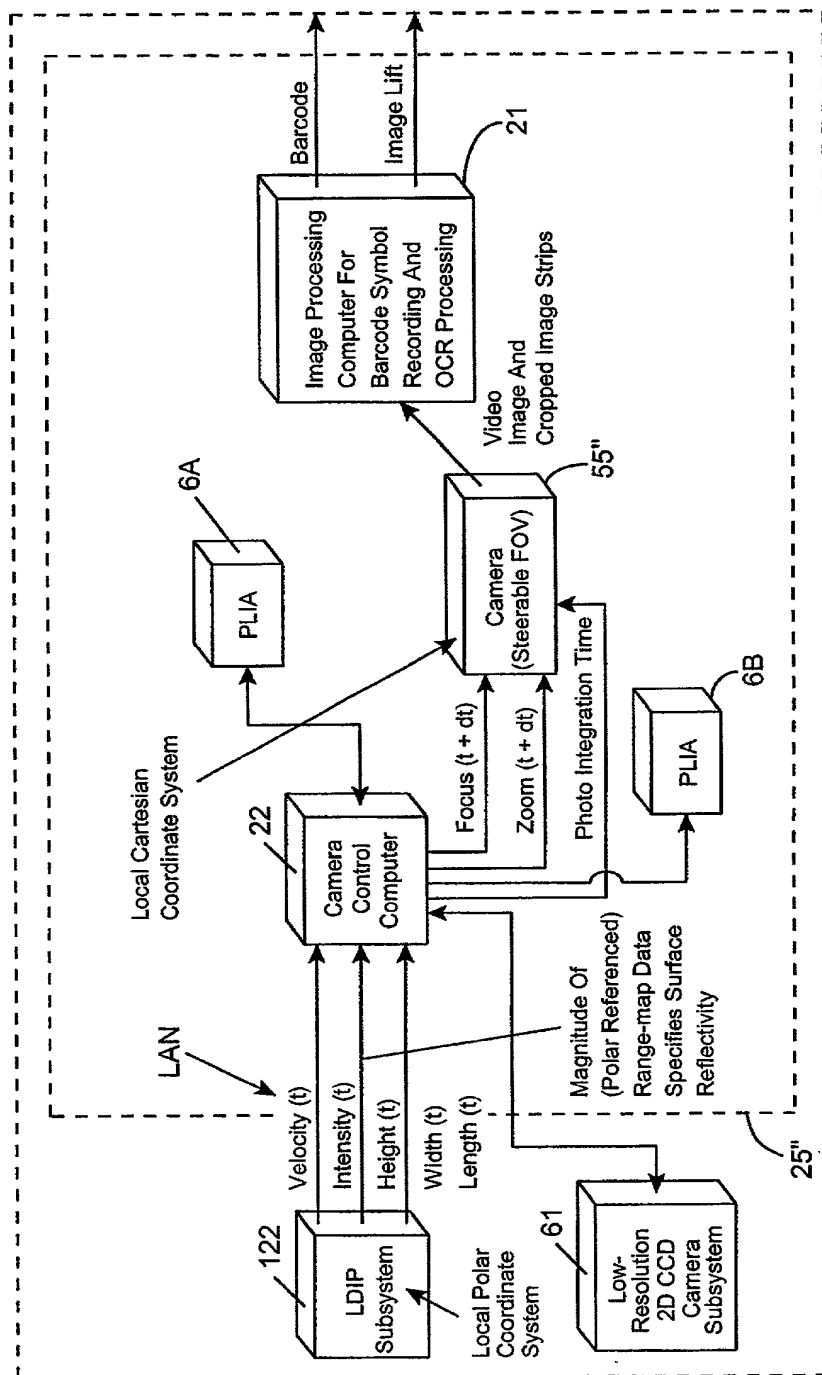


FIG. 26

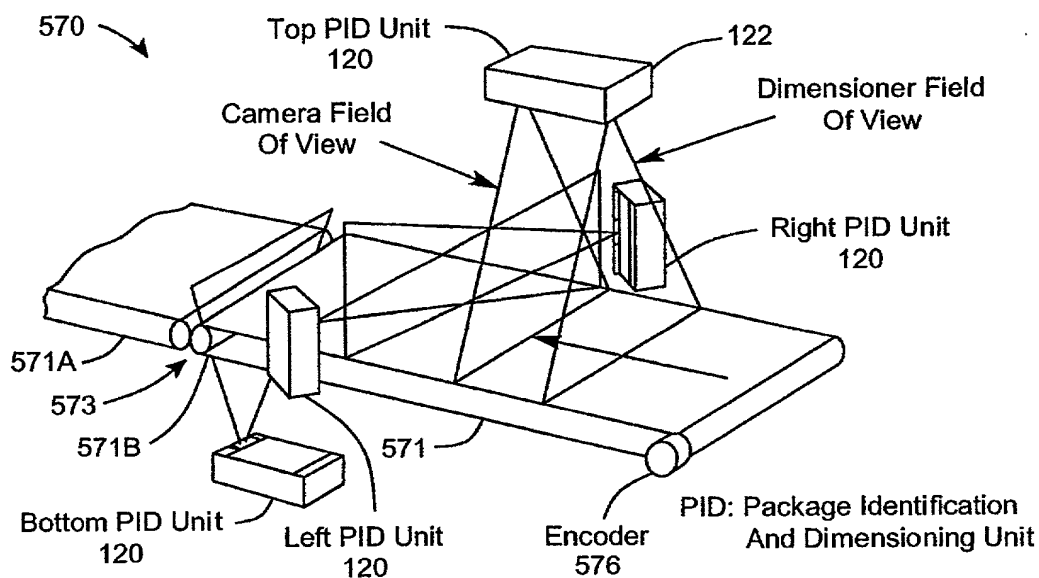


FIG. 27

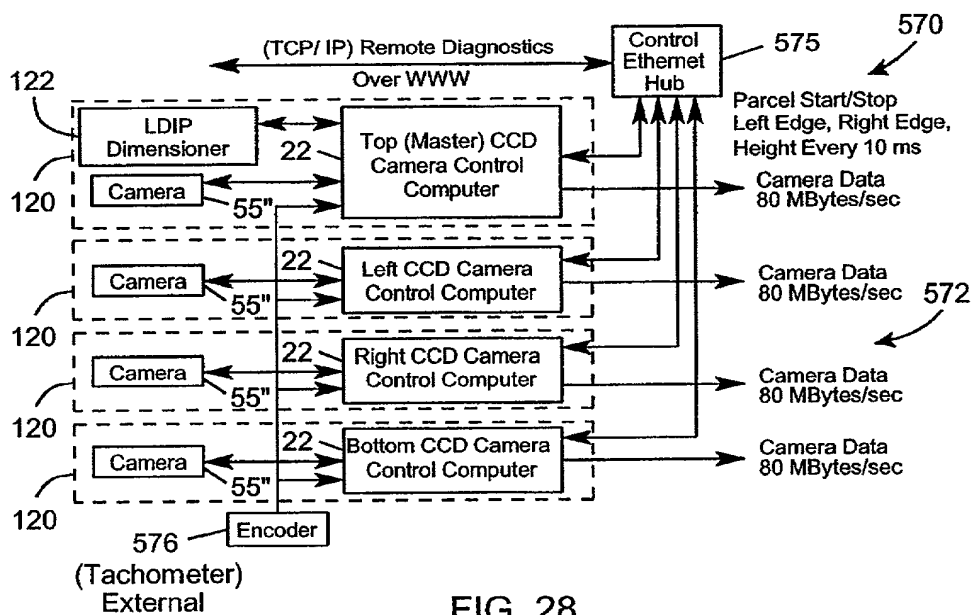


FIG. 28

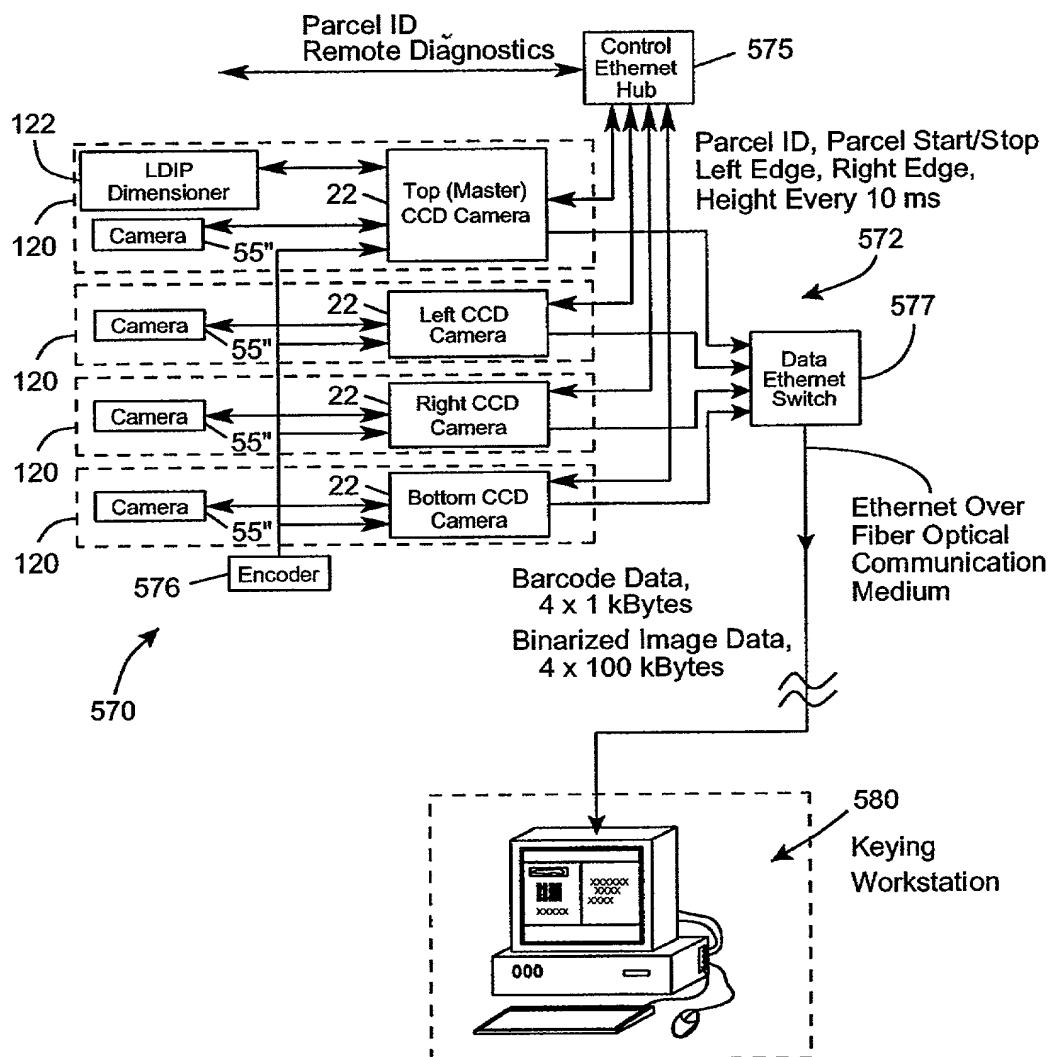


FIG. 29

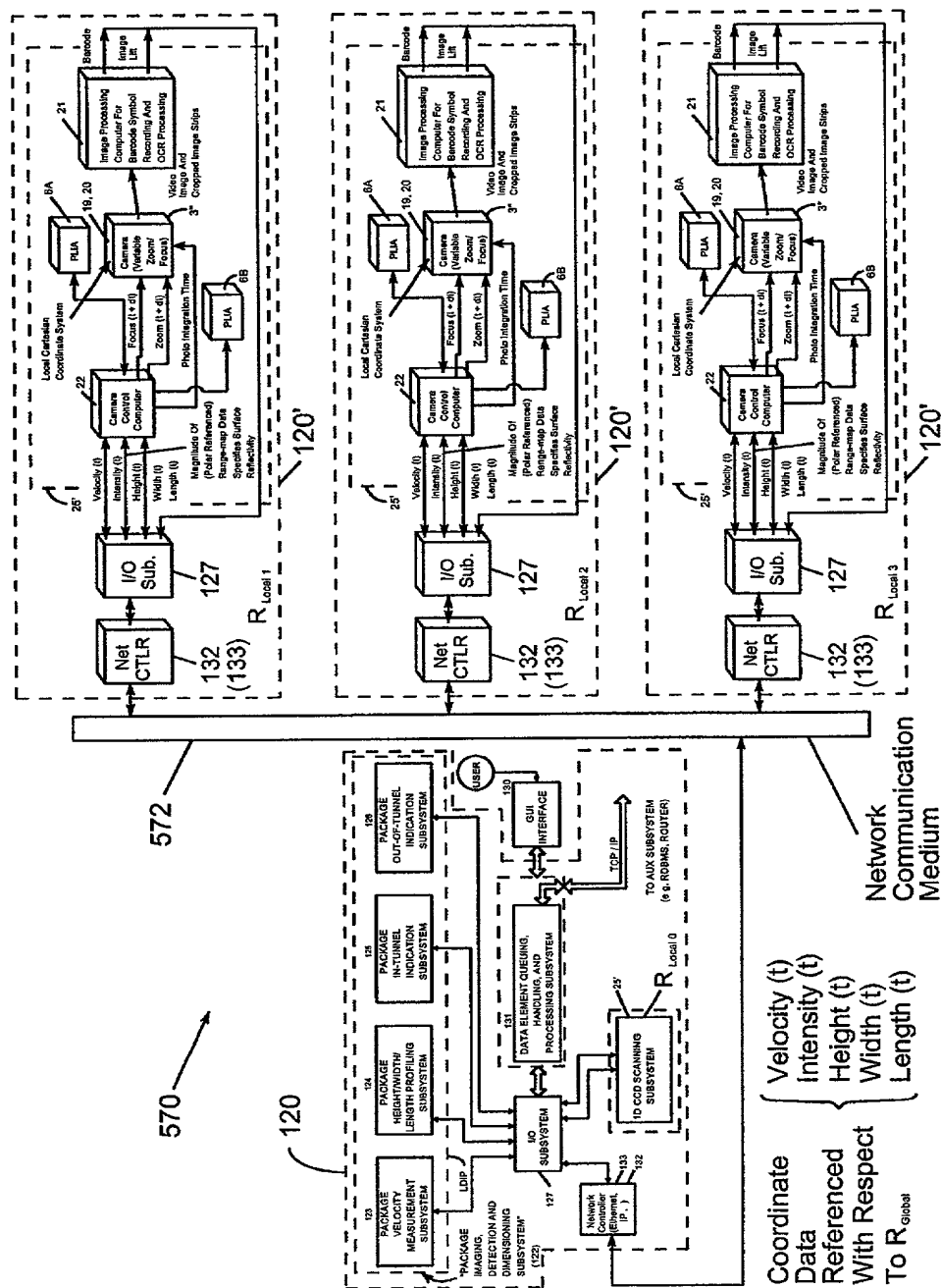


FIG. 30

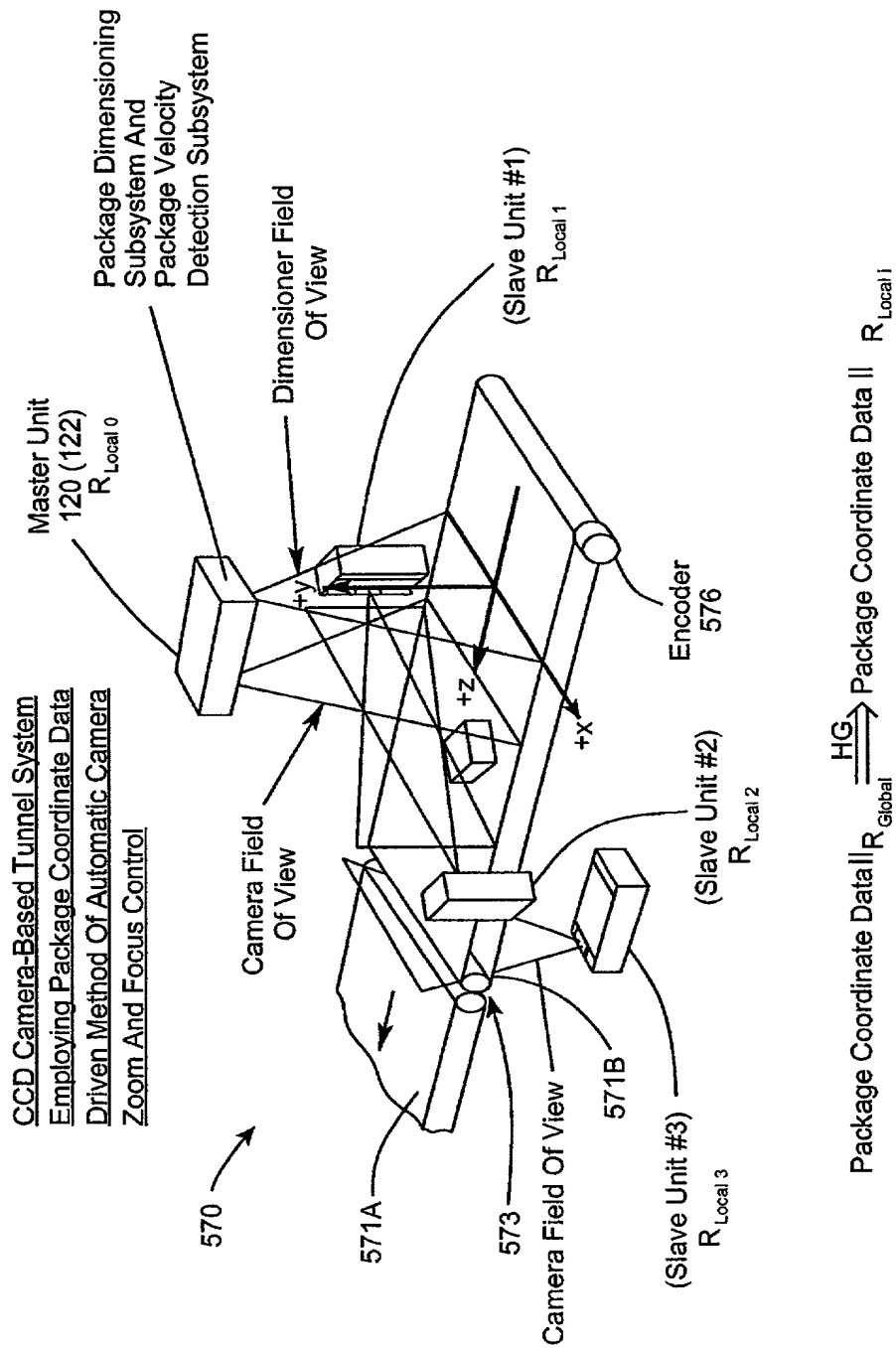


FIG. 31



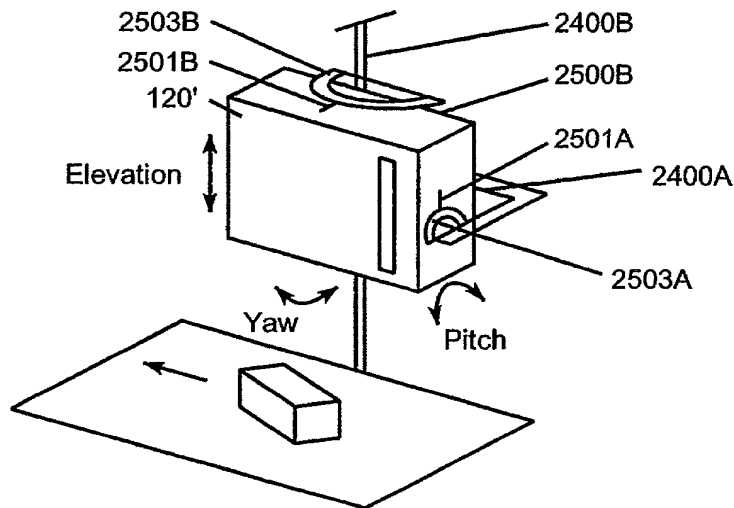


FIG. 31A

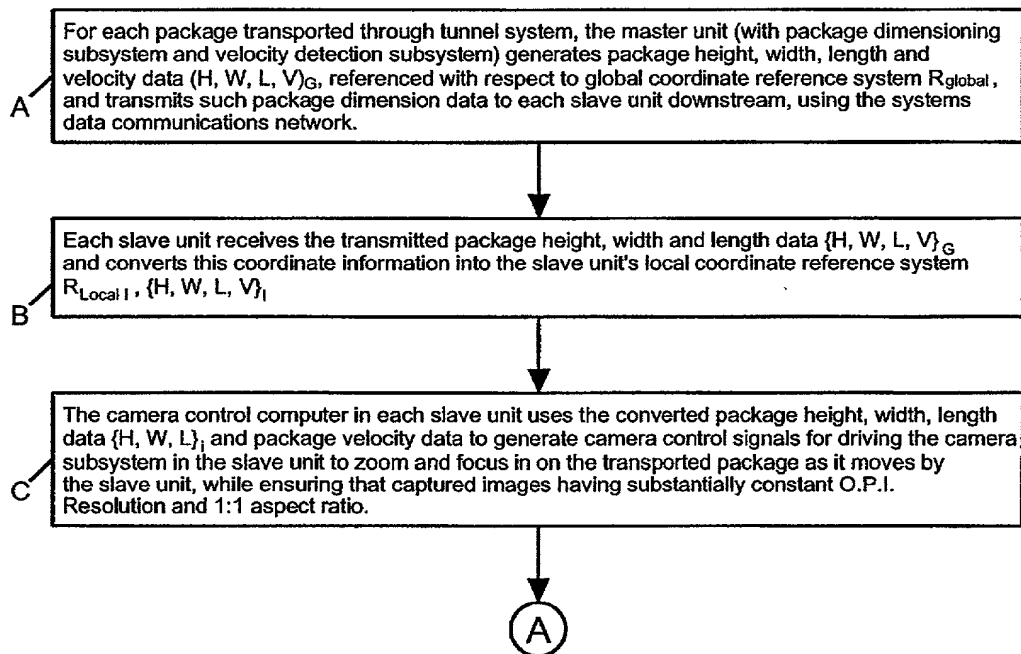


FIG. 32A

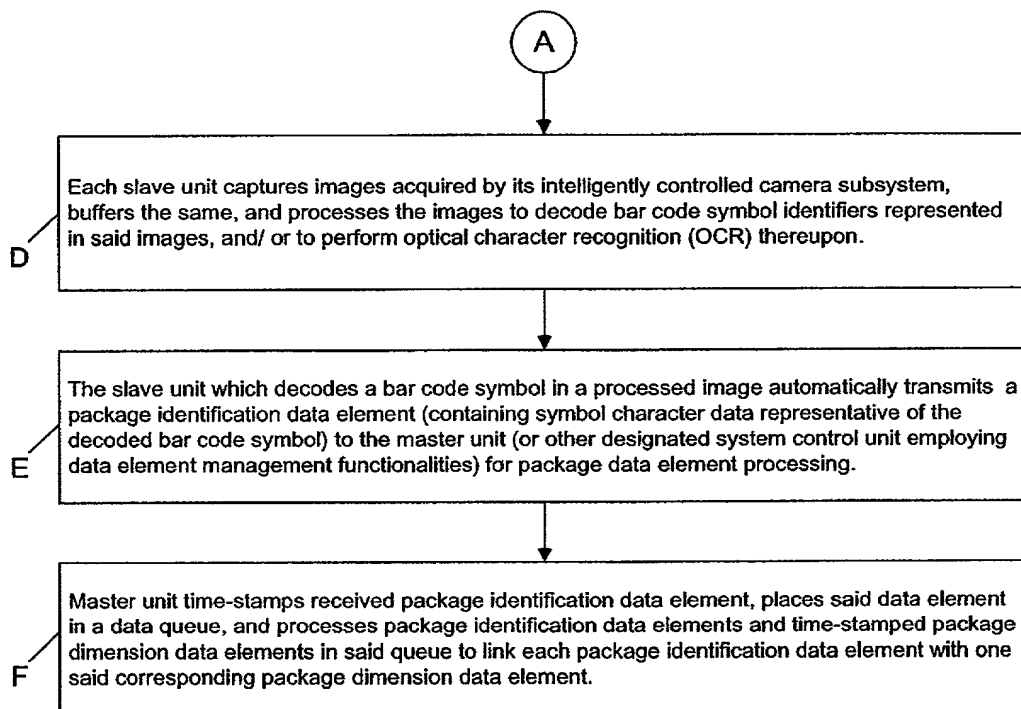


FIG. 32B

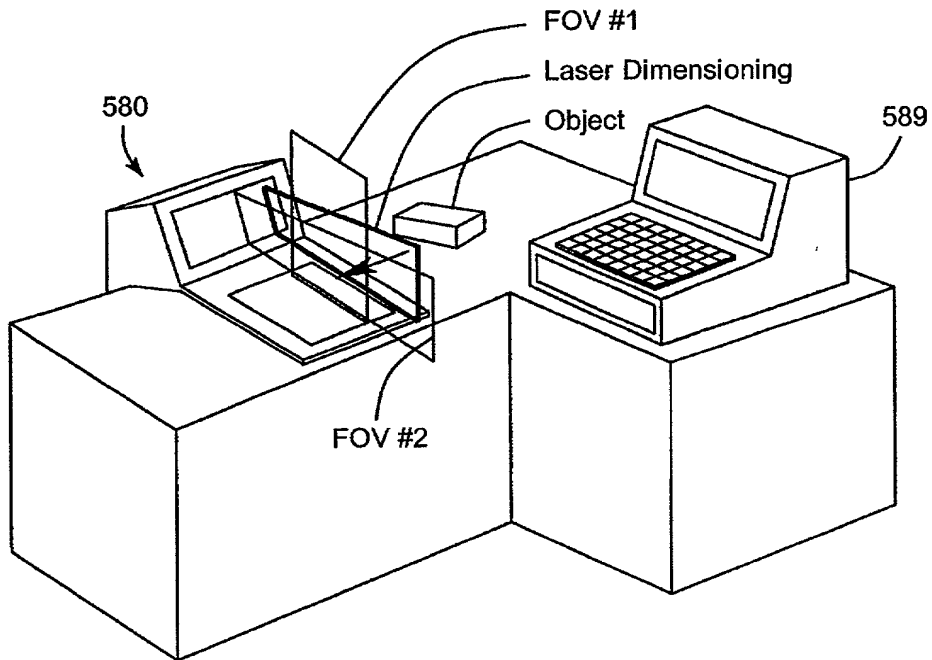


FIG. 33A

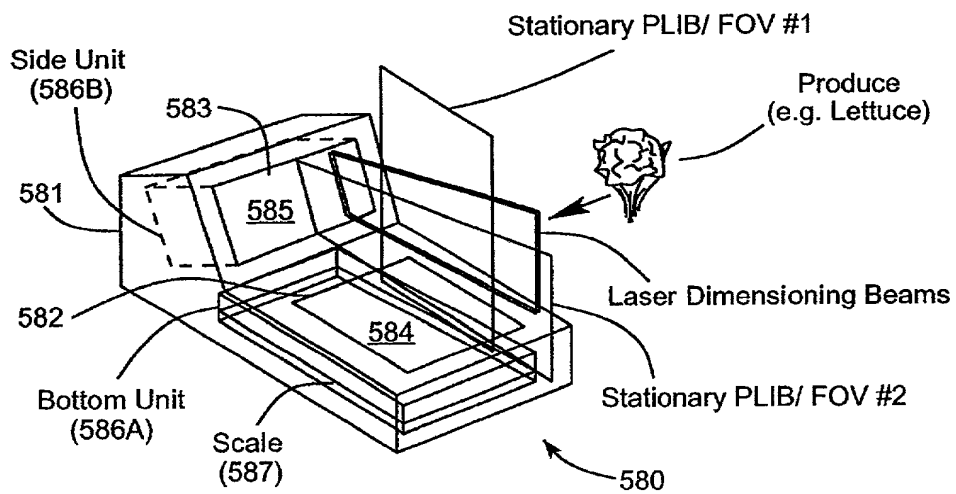


FIG. 33B

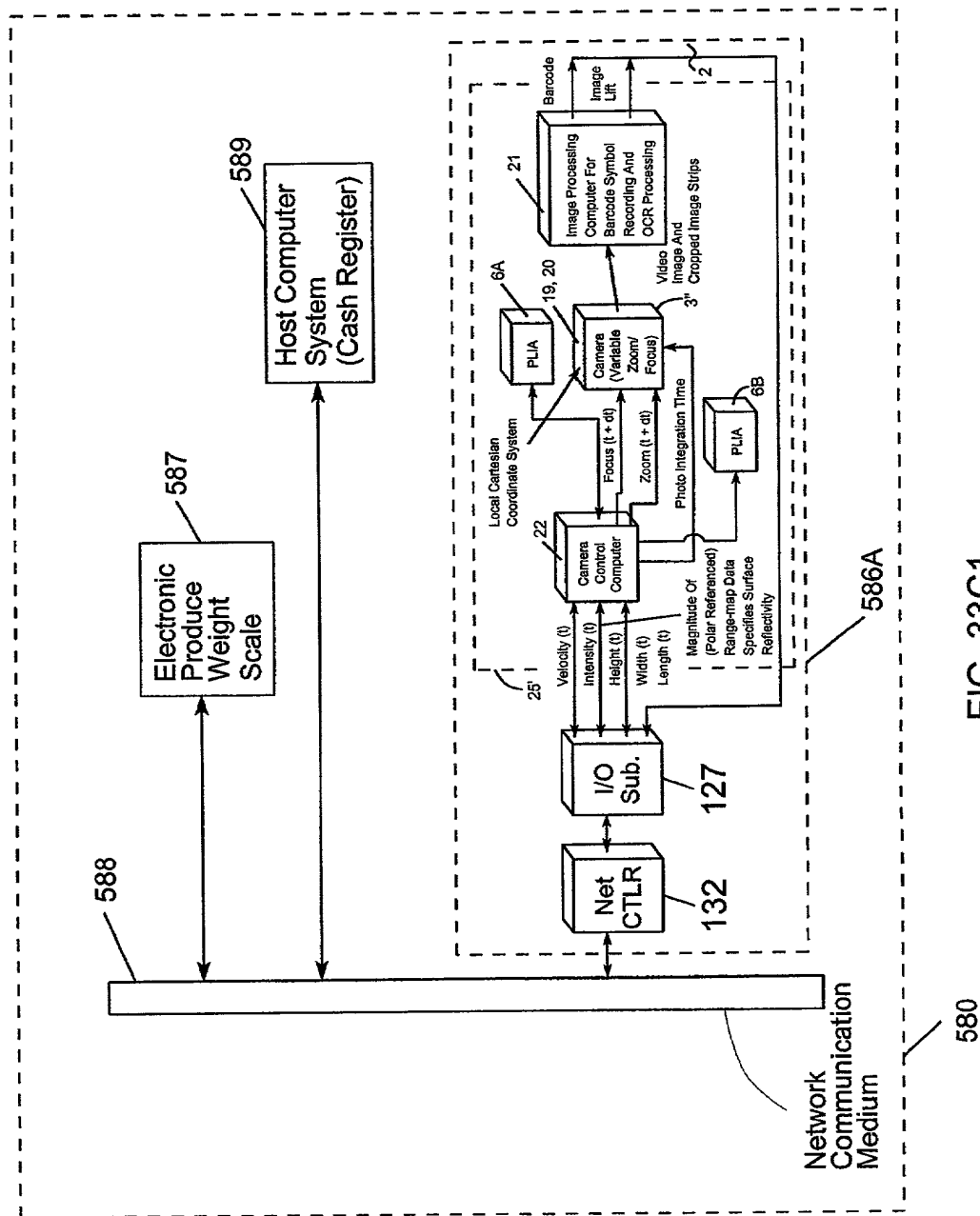


FIG. 33C1



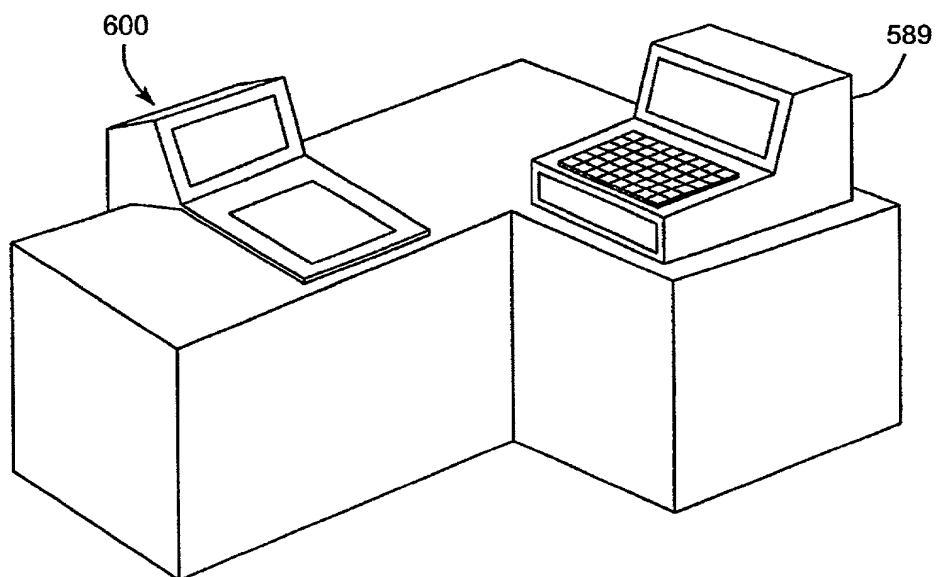


FIG. 34A

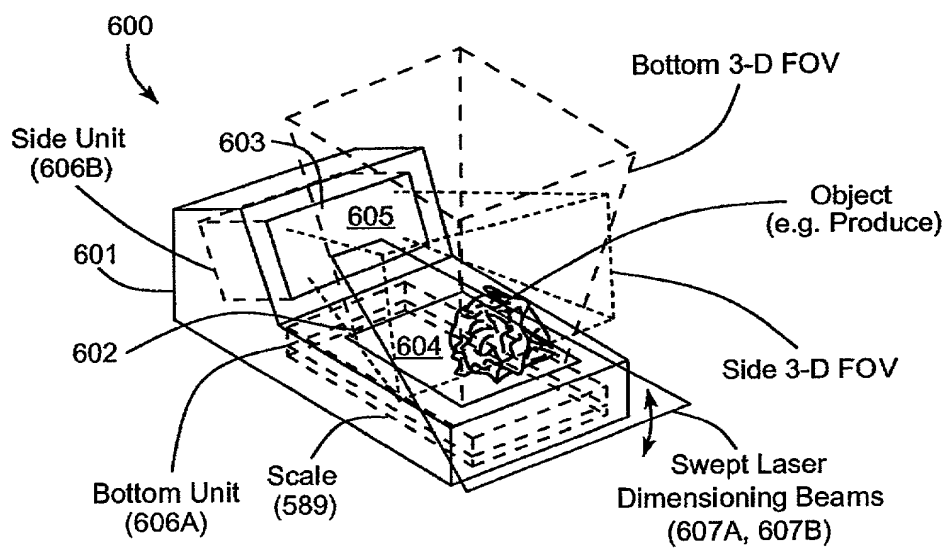


FIG. 34B

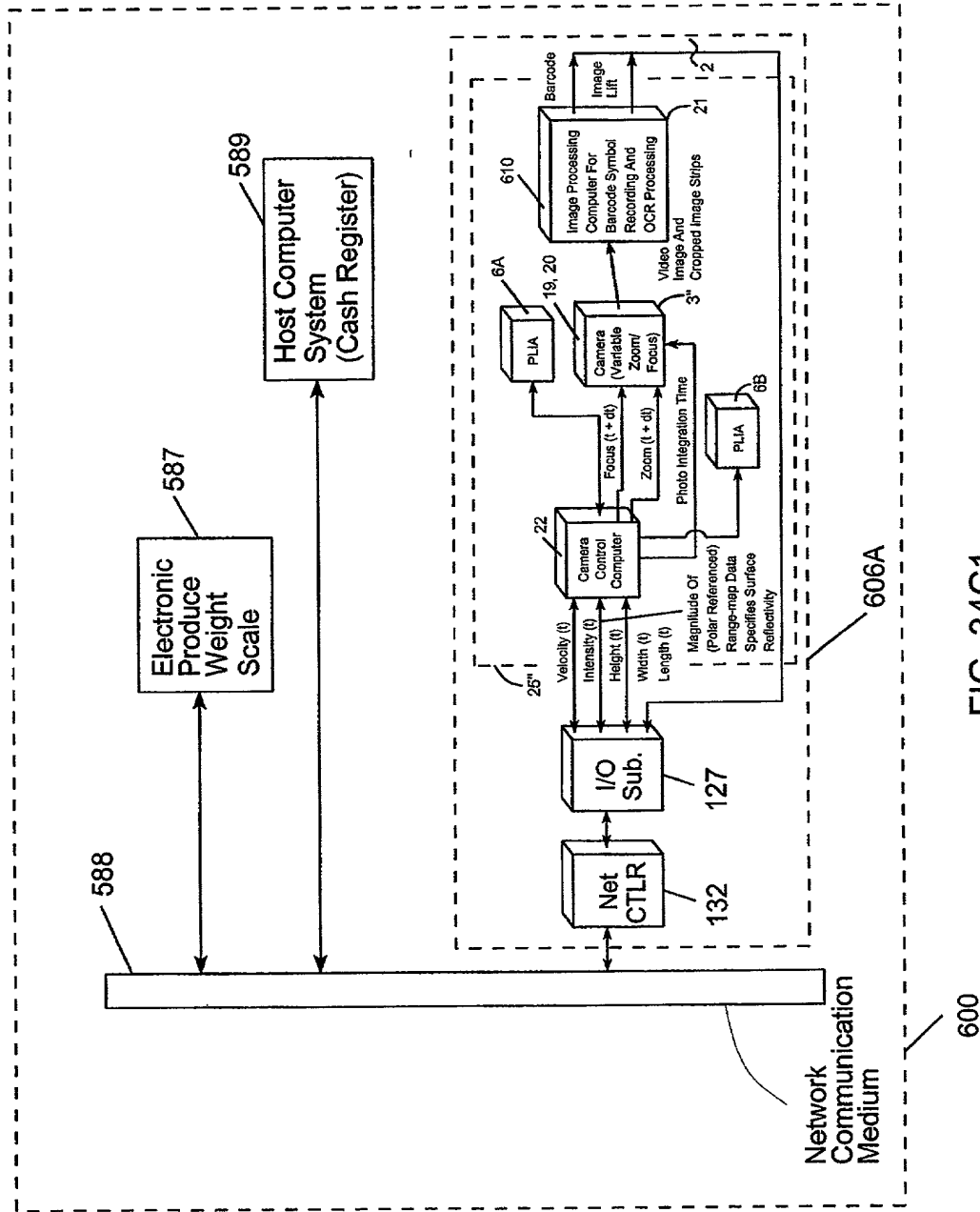


FIG. 34C1

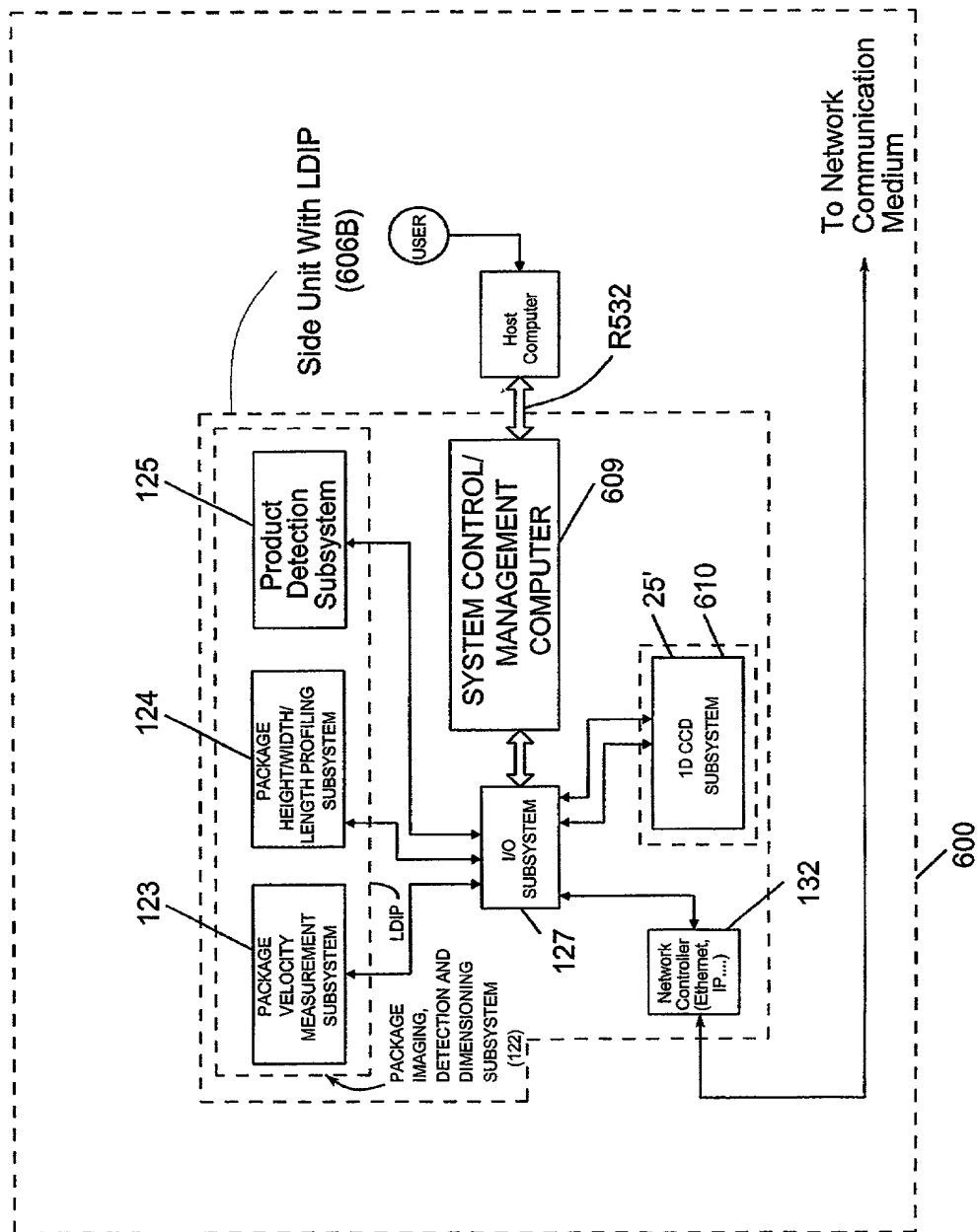


FIG. 34C2



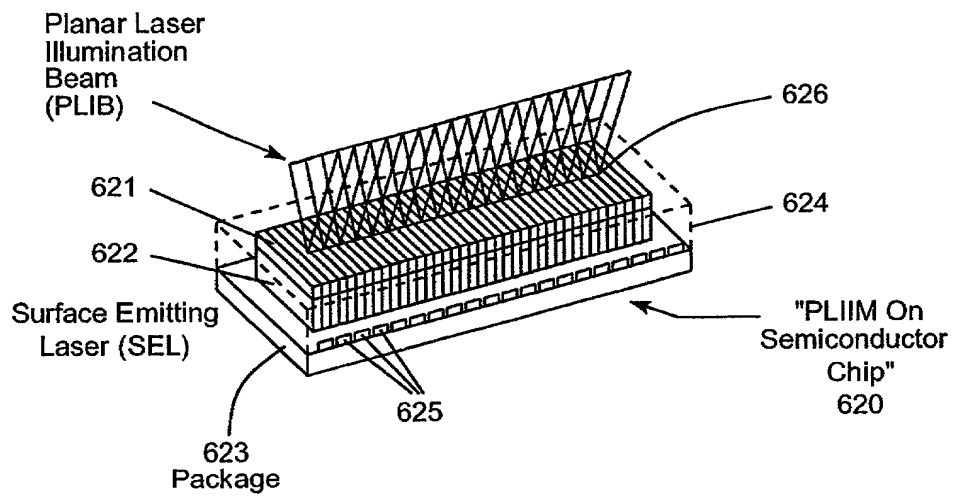


FIG. 35A

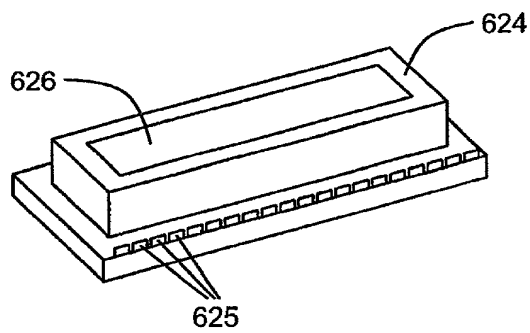


FIG. 35B

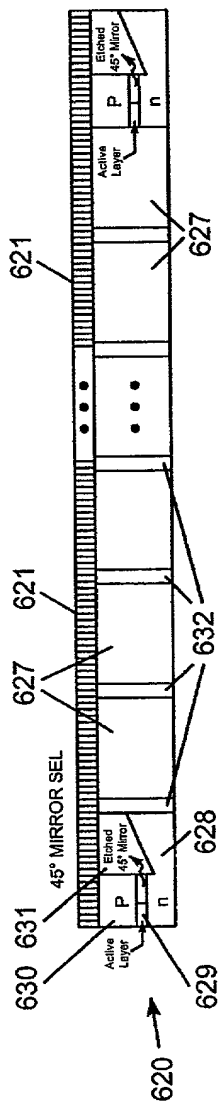


FIG. 36A

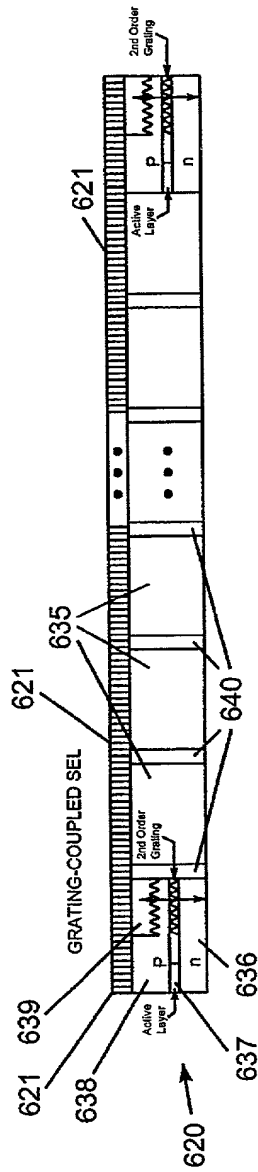


FIG. 36B

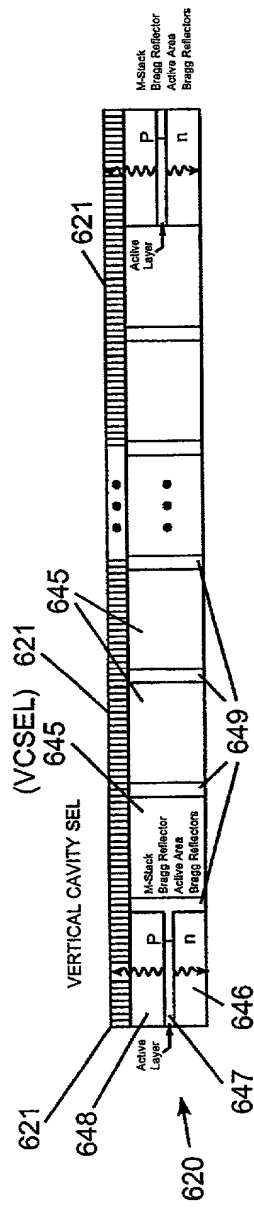


FIG. 36C

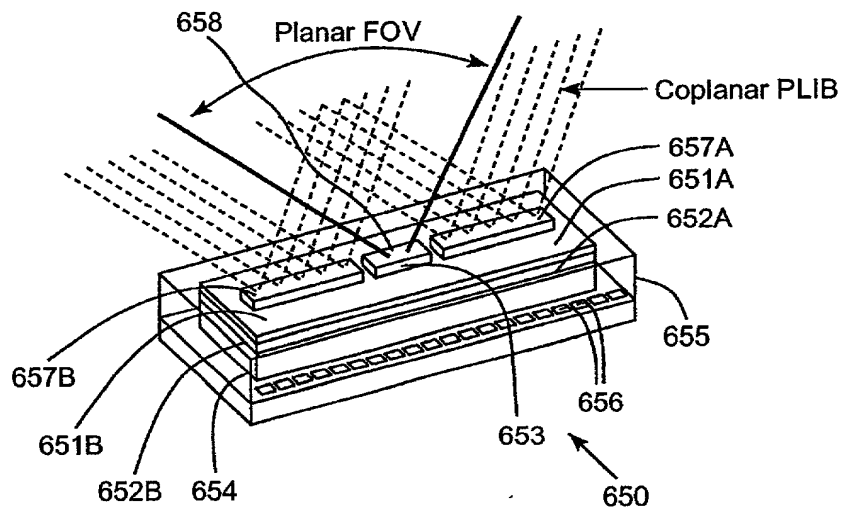


FIG. 37

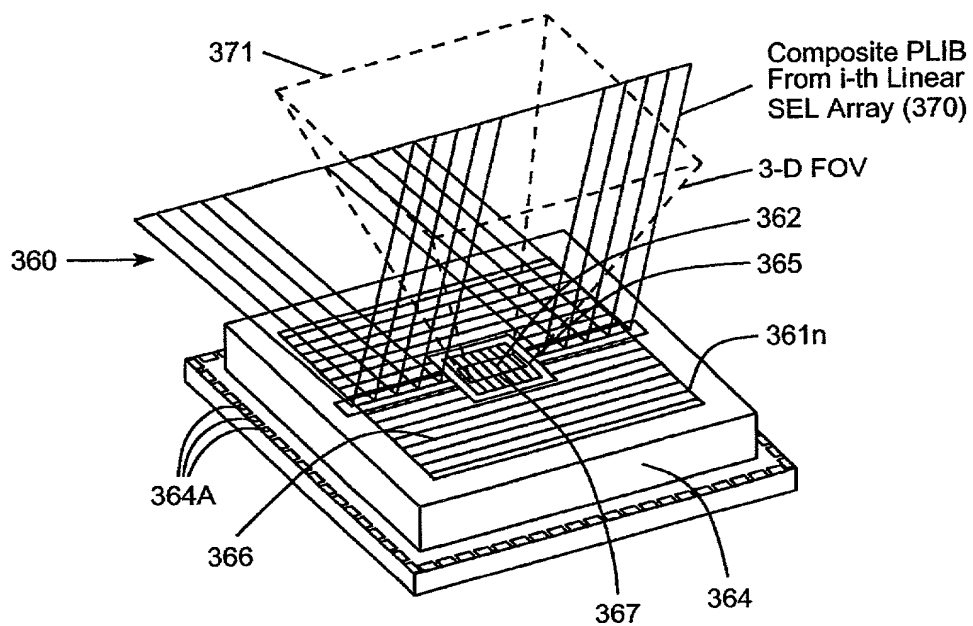


FIG. 38A

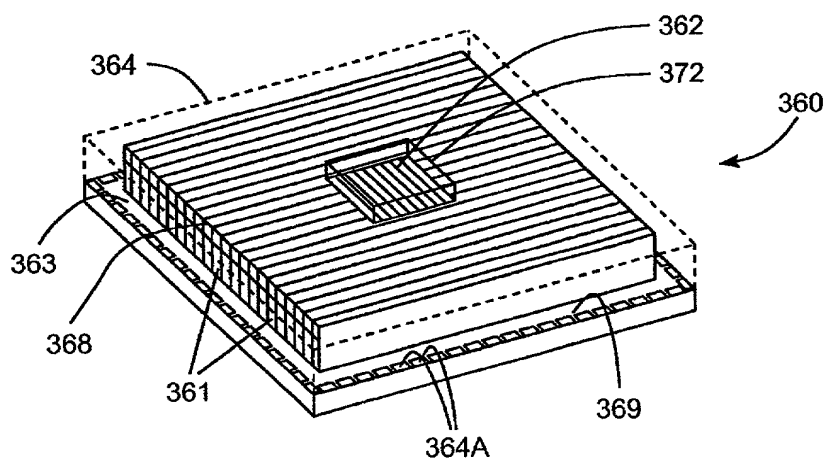


FIG. 38B

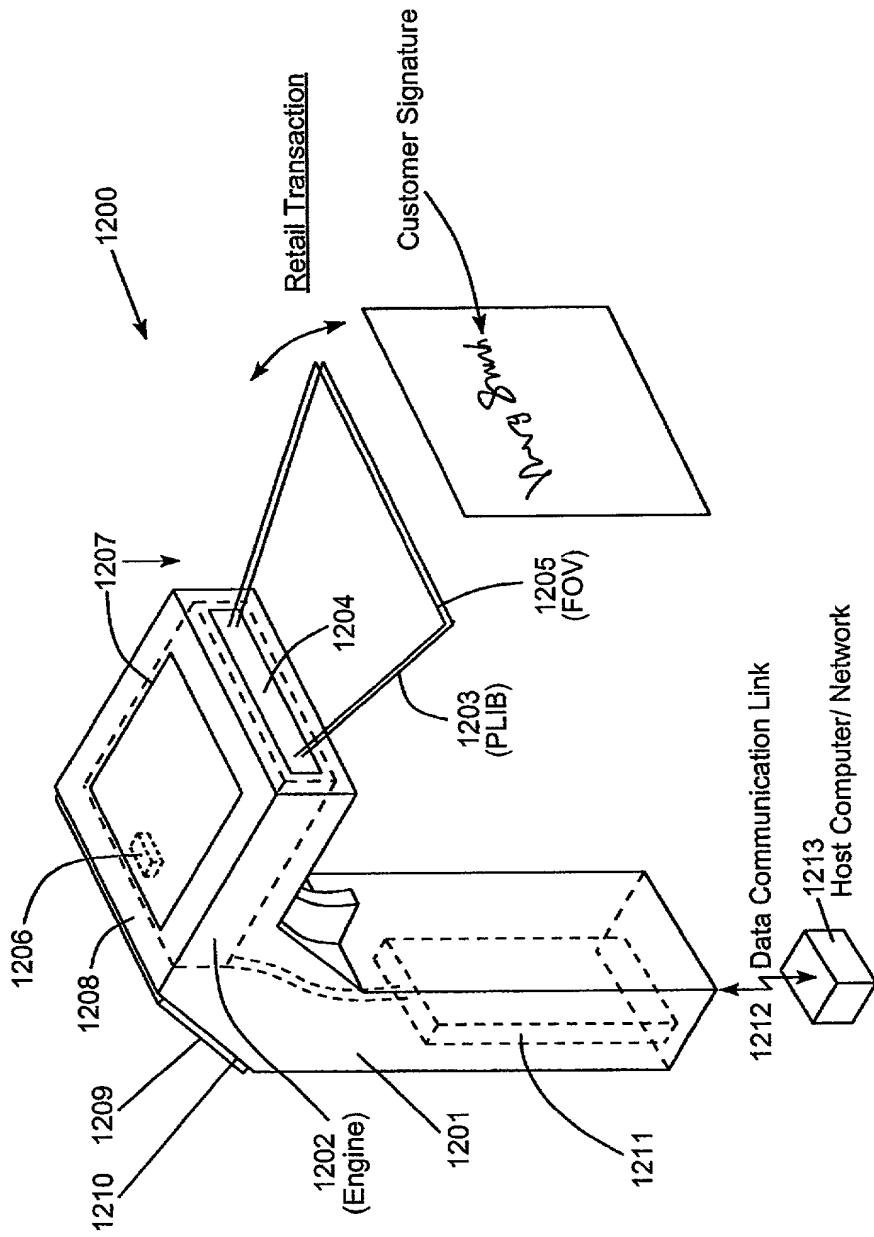


FIG. 39A

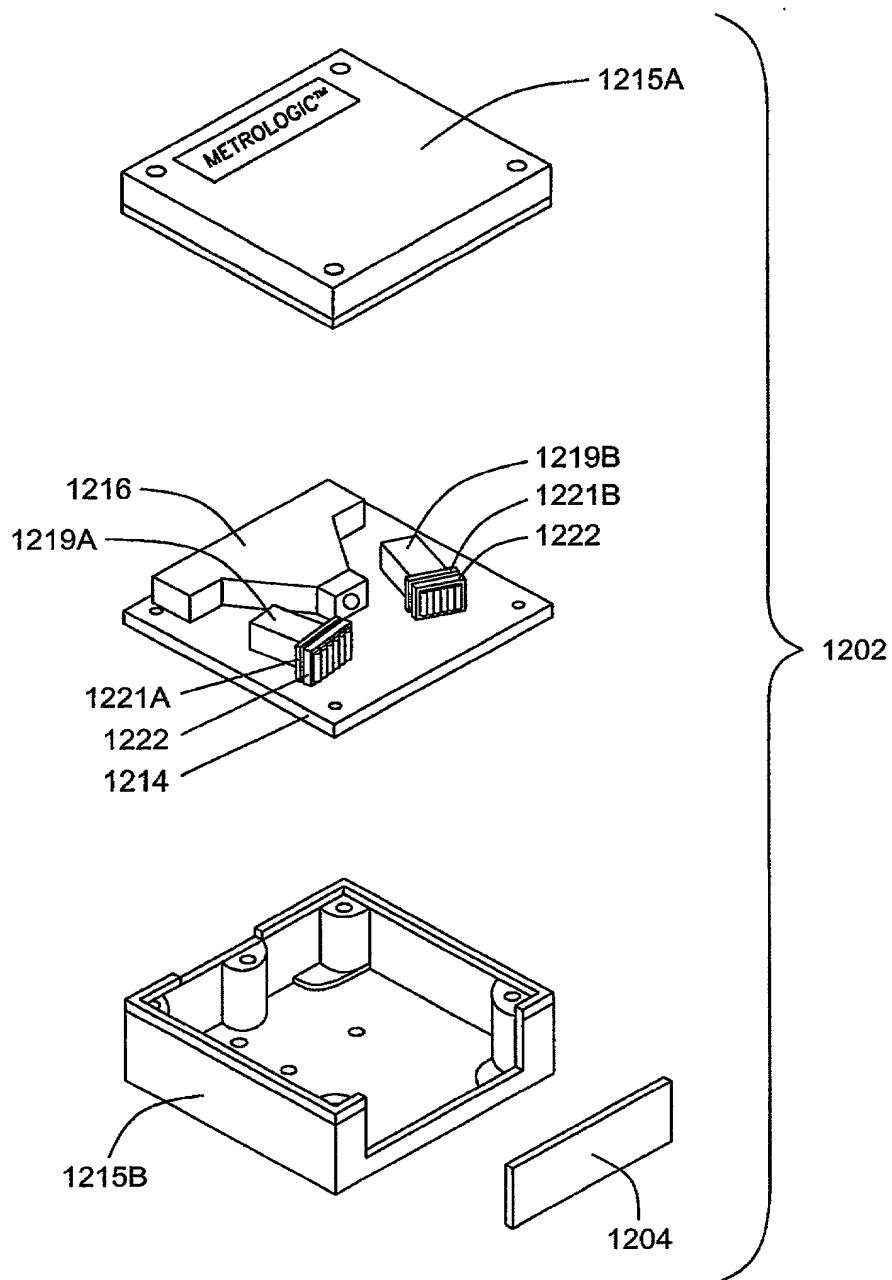


FIG. 39B

FIG. 39C

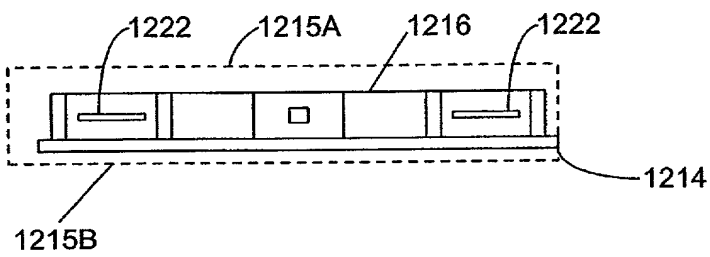


FIG. 39D

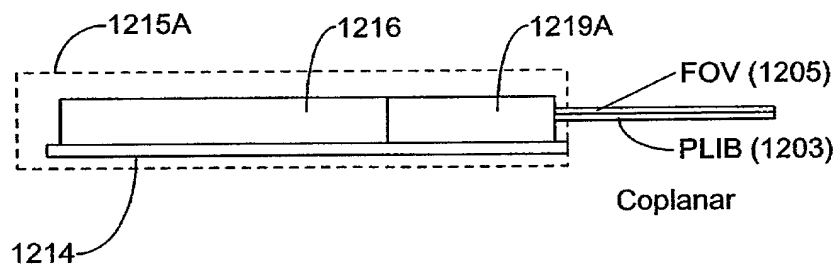


FIG. 39E



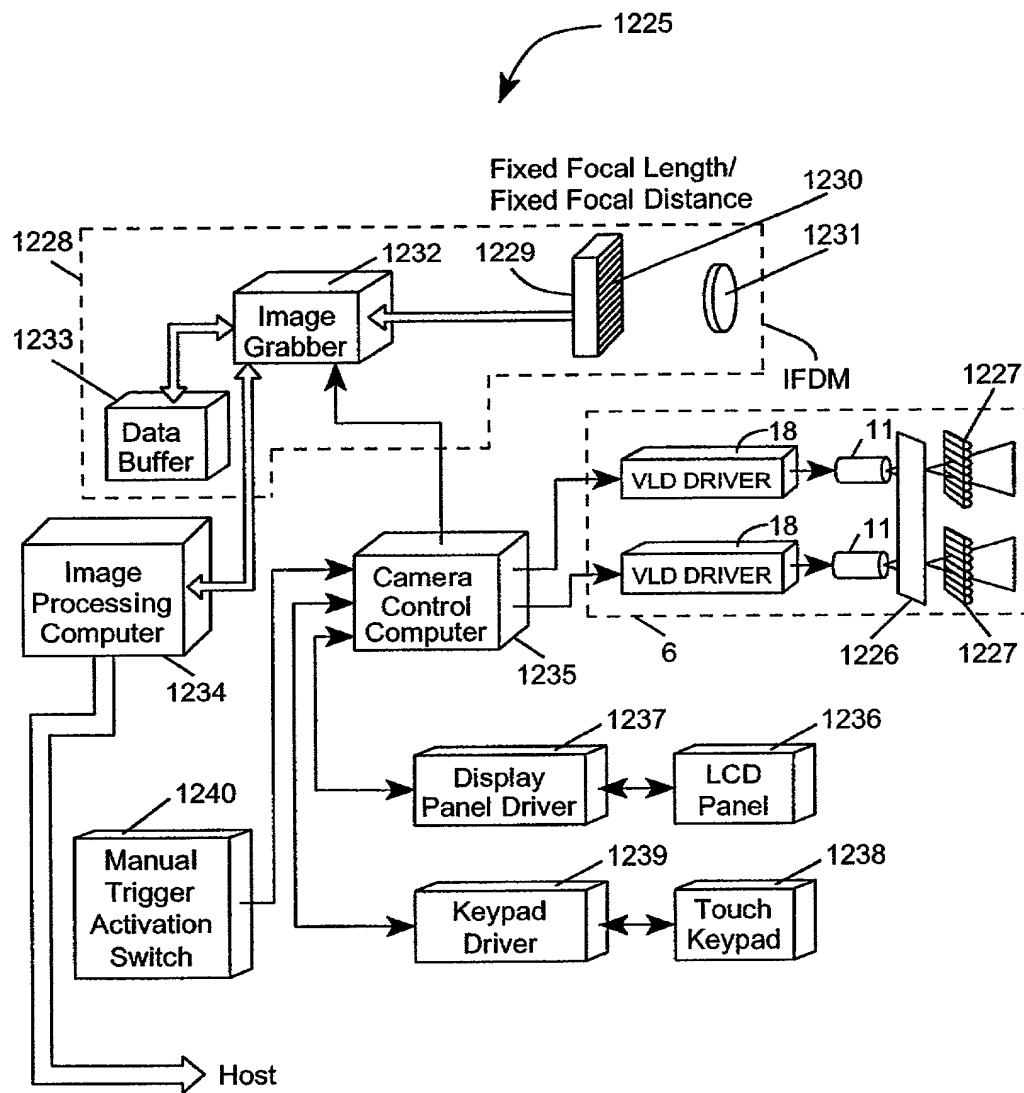
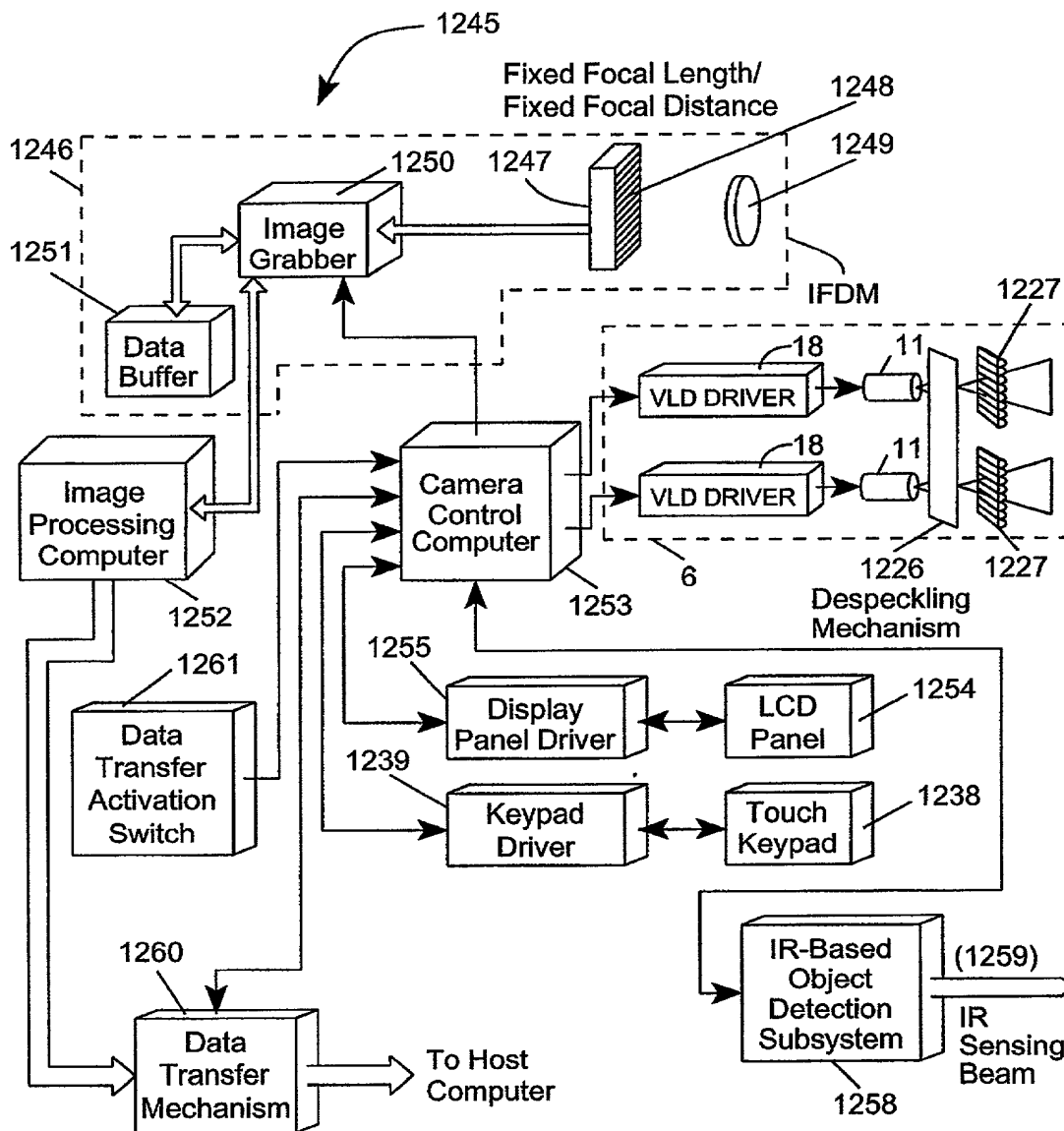
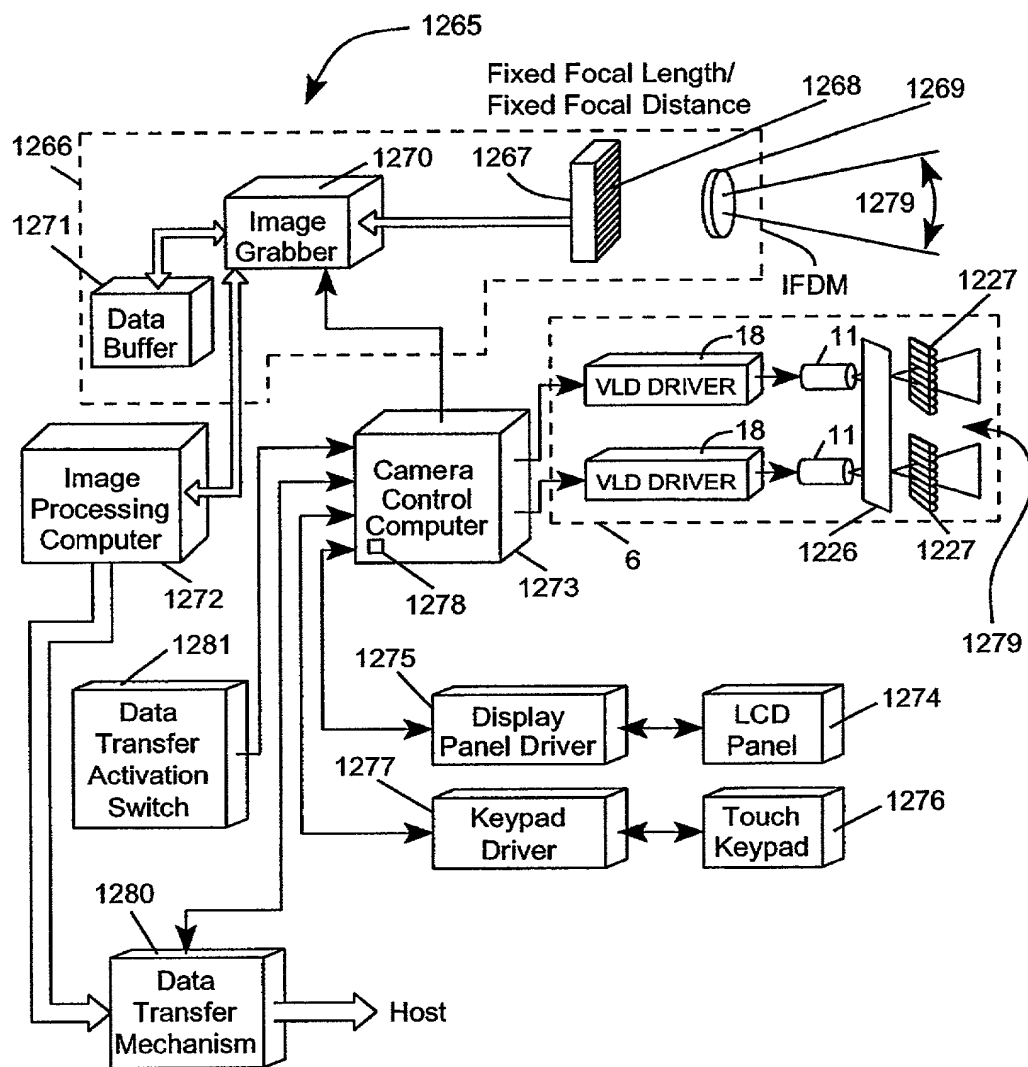


FIG. 40A1



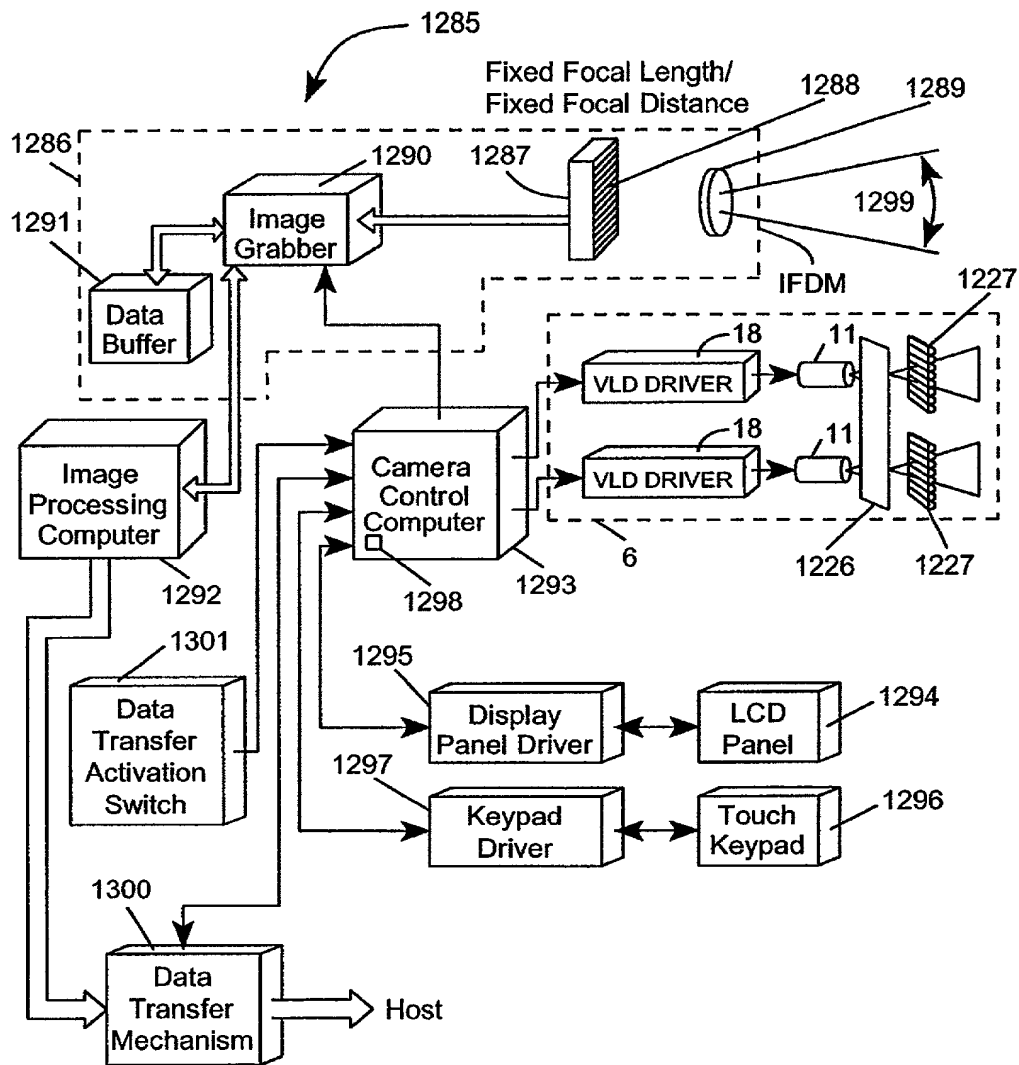
Automatic with IR Object Detection

FIG. 40A2



### Automatic with Laser Based Object Detection

FIG. 40A3



Automatic with Passive CCD  
Based Object Detection

FIG. 40A4

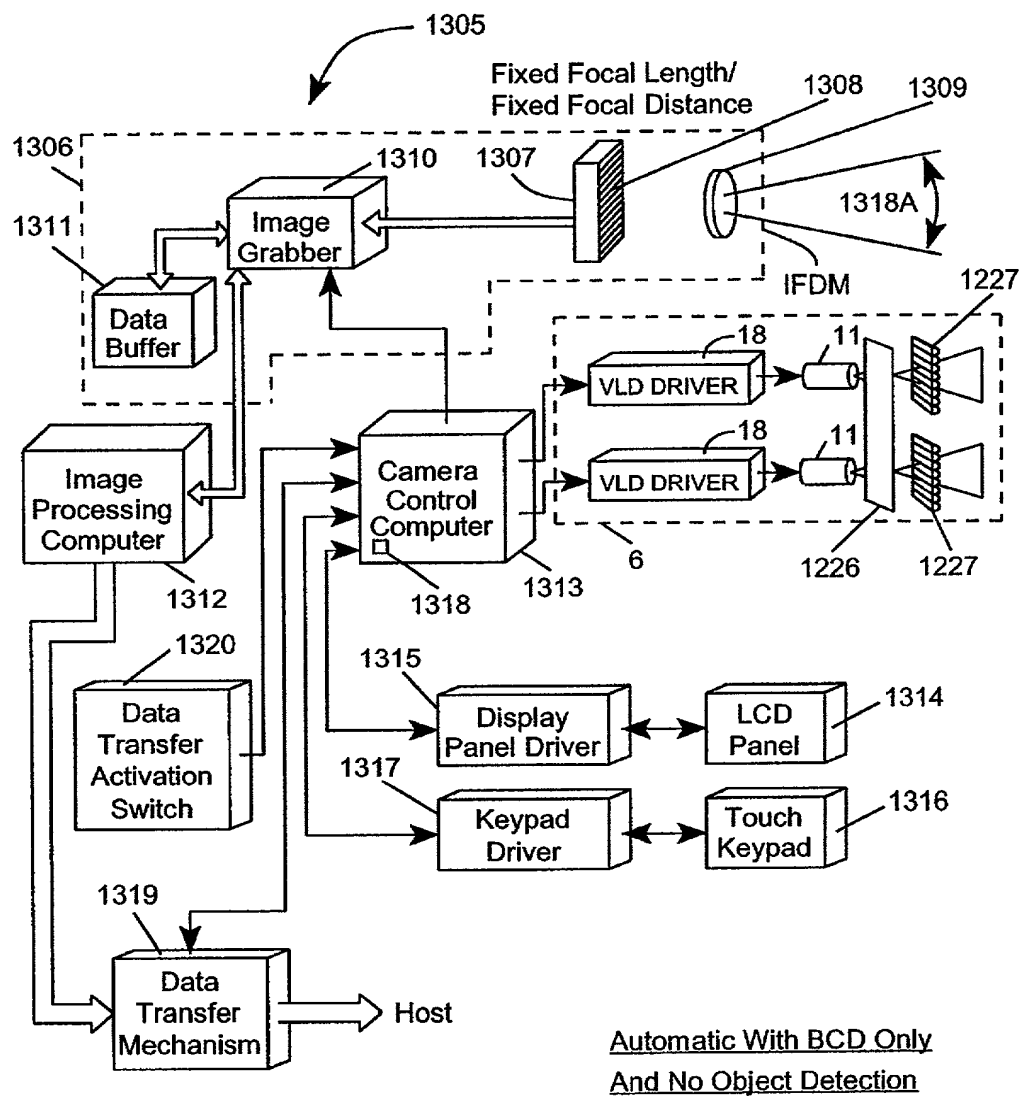


FIG. 40A5

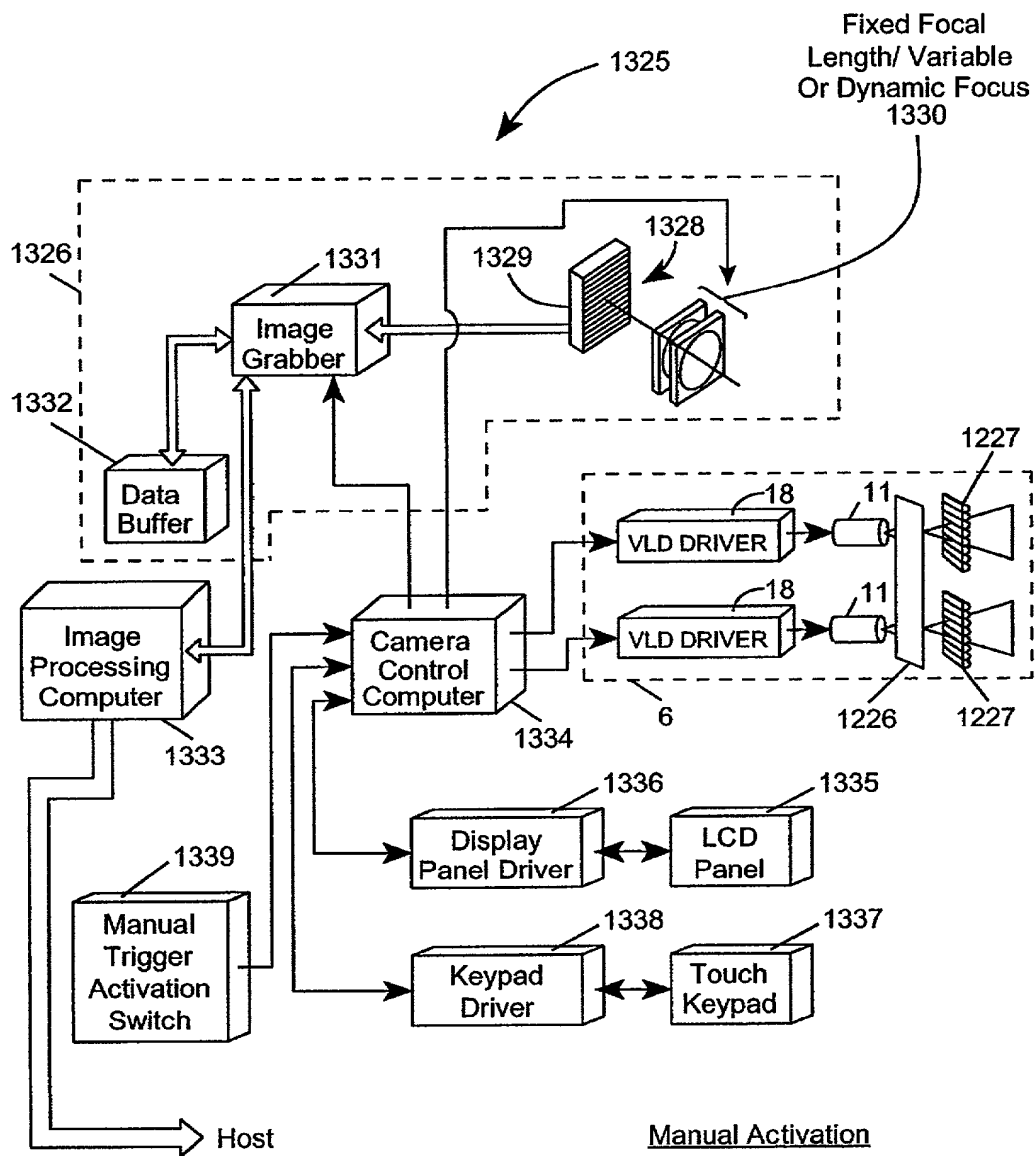


FIG. 40B1

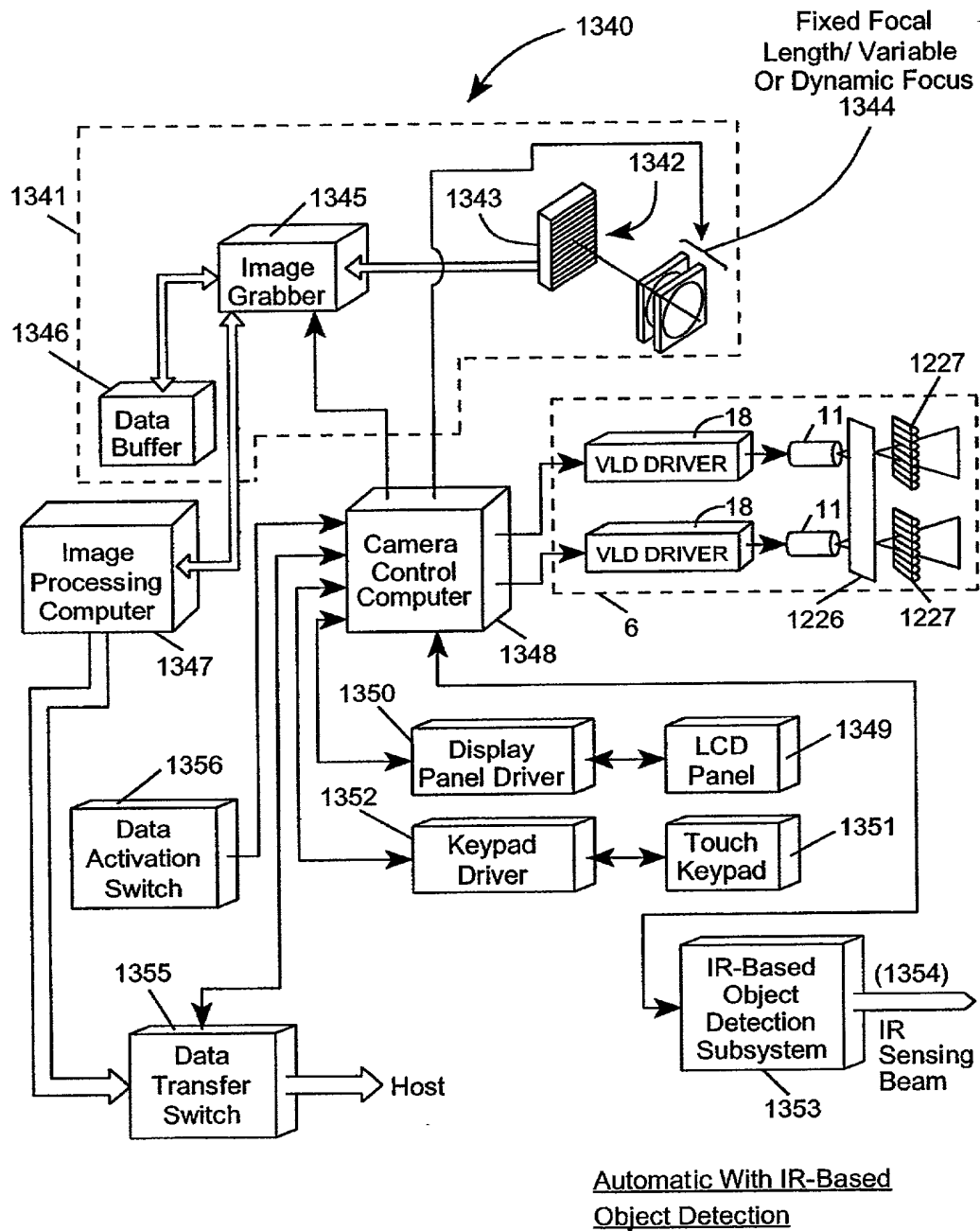


FIG. 40B2

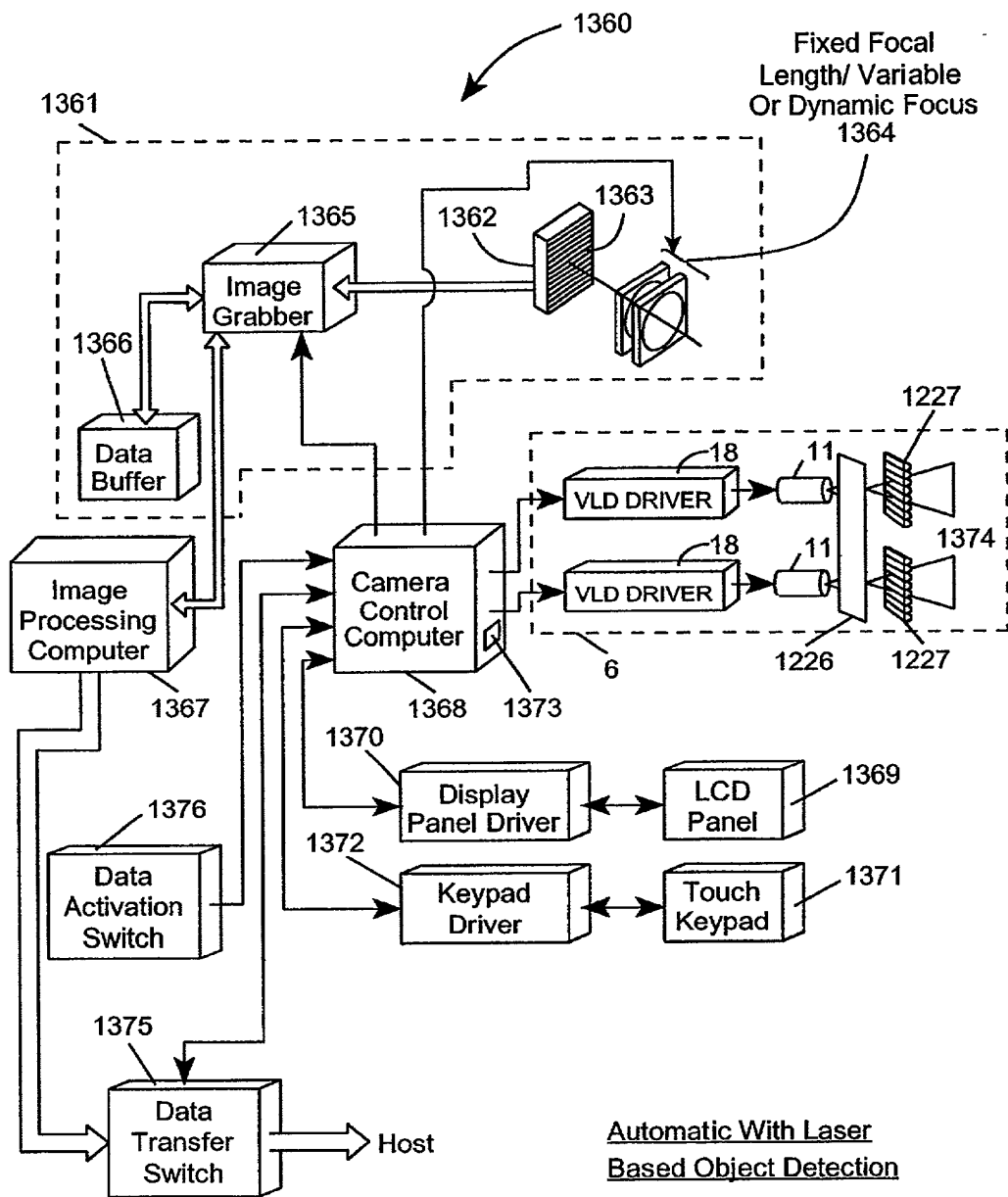


FIG. 40B3



The diagram illustrates a camera system 1380. A dashed box 1381 encloses the camera 1384, which includes an Image Grabber 1385, a Data Buffer 1386, and a lens assembly 1382/1383. The lens assembly 1384 is labeled as having a 'Fixed Focal Length/ Variable Or Dynamic Focus'. The Image Grabber 1385 is connected to an Image Processing Computer 1387 and a Camera Control Computer 1388. The Data Buffer 1386 is connected to the Image Processing Computer 1387. The Camera Control Computer 1388 is connected to two VLD DRIVERS 18, which are connected to two cylindrical components 11. These components 11 are connected to a vertical plate 1226, which is connected to two sets of horizontal lines 1227. The Camera Control Computer 1388 is also connected to a Display Panel Driver 1390, a Keypad Driver 1392, and a Data Transfer Mechanism 1395. The Display Panel Driver 1390 is connected to an LCD Panel 1389. The Keypad Driver 1392 is connected to a Touch Keypad 1391. The Data Transfer Mechanism 1395 is connected to a Host. A Data Activation Switch 1396 is connected to the Image Processing Computer 1387 and the Data Transfer Mechanism 1395. A label 6 is located near the VLD DRIVERS 18.

FIG. 40B4

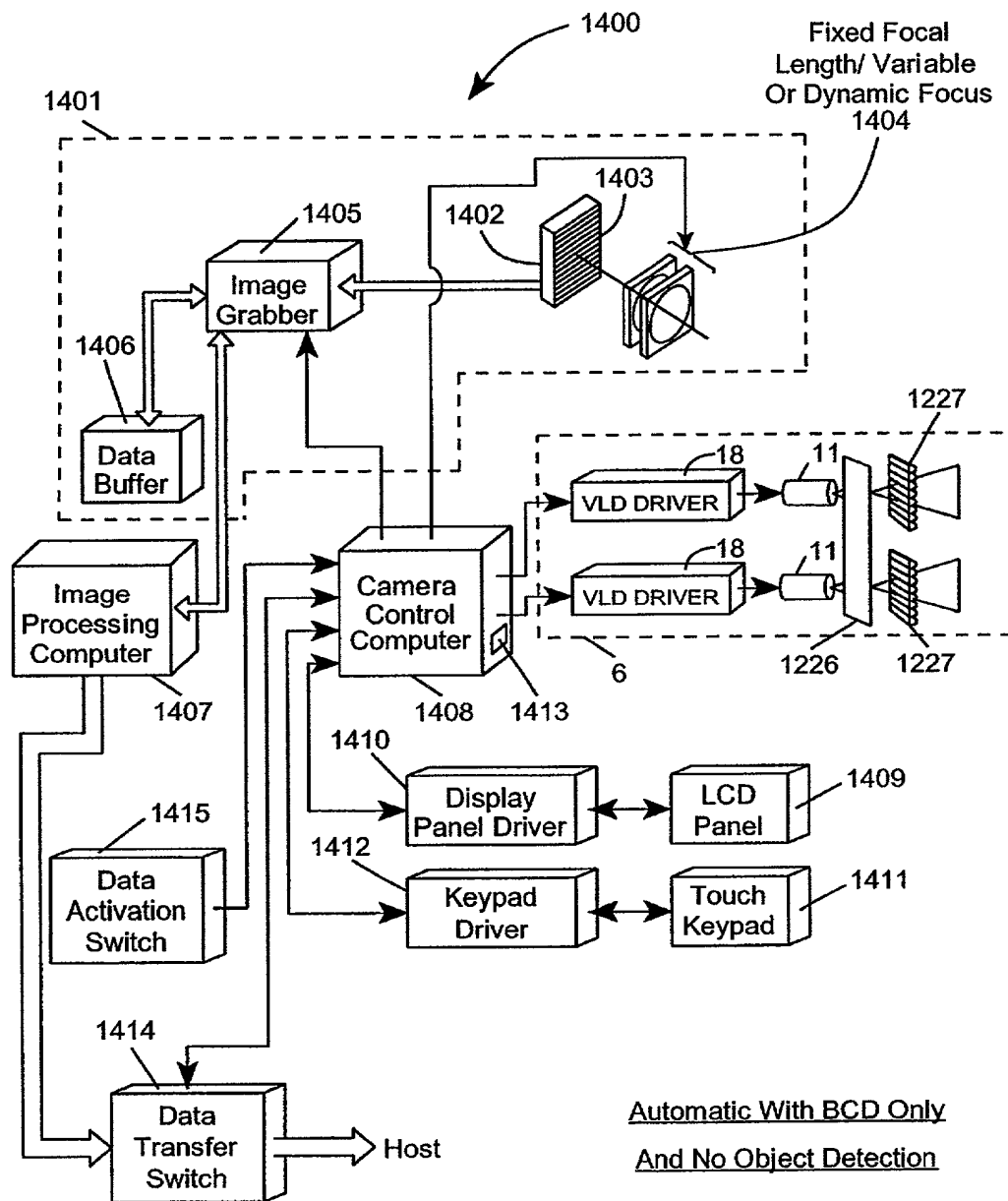


FIG. 40B5

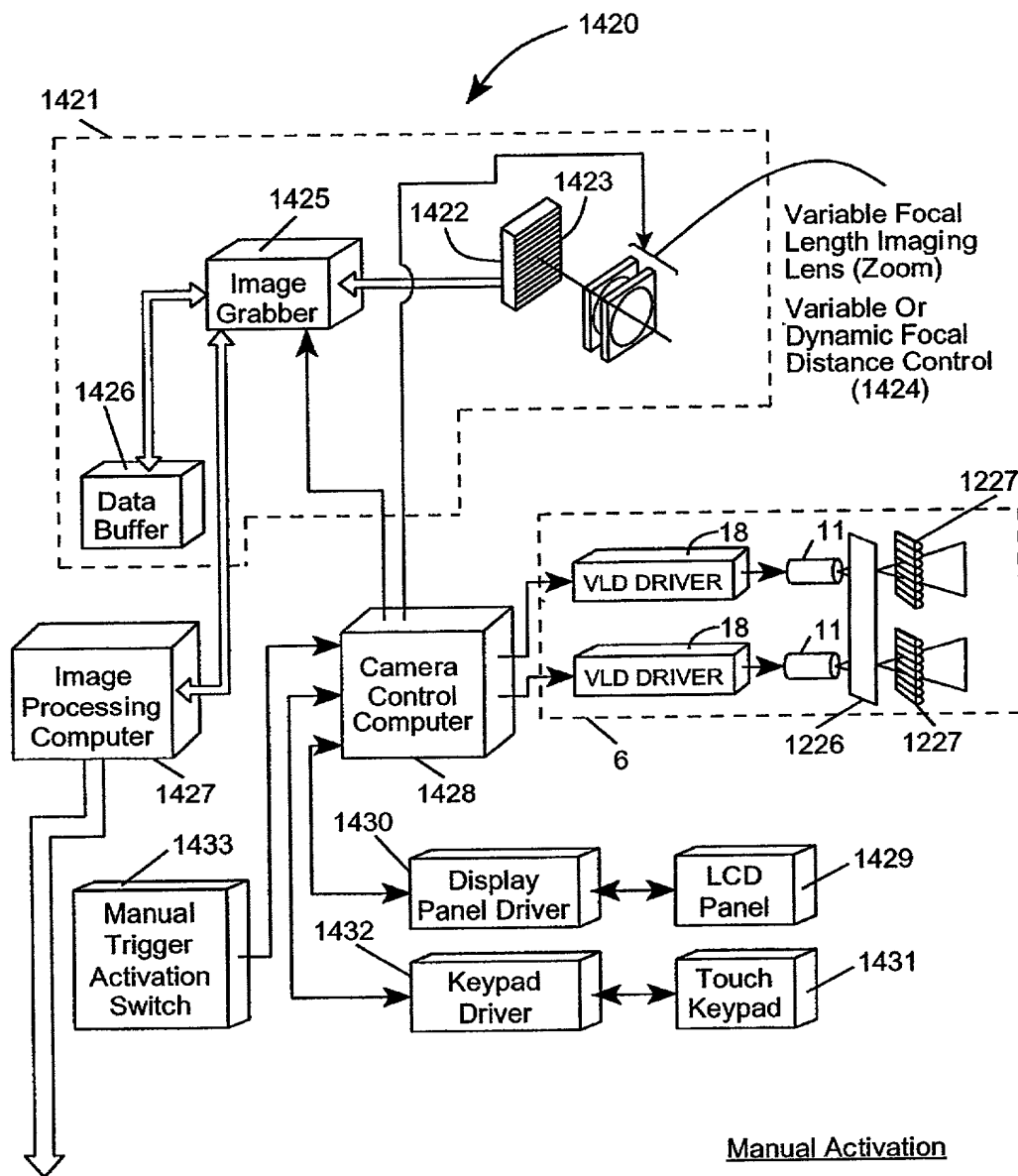


FIG. 40C1

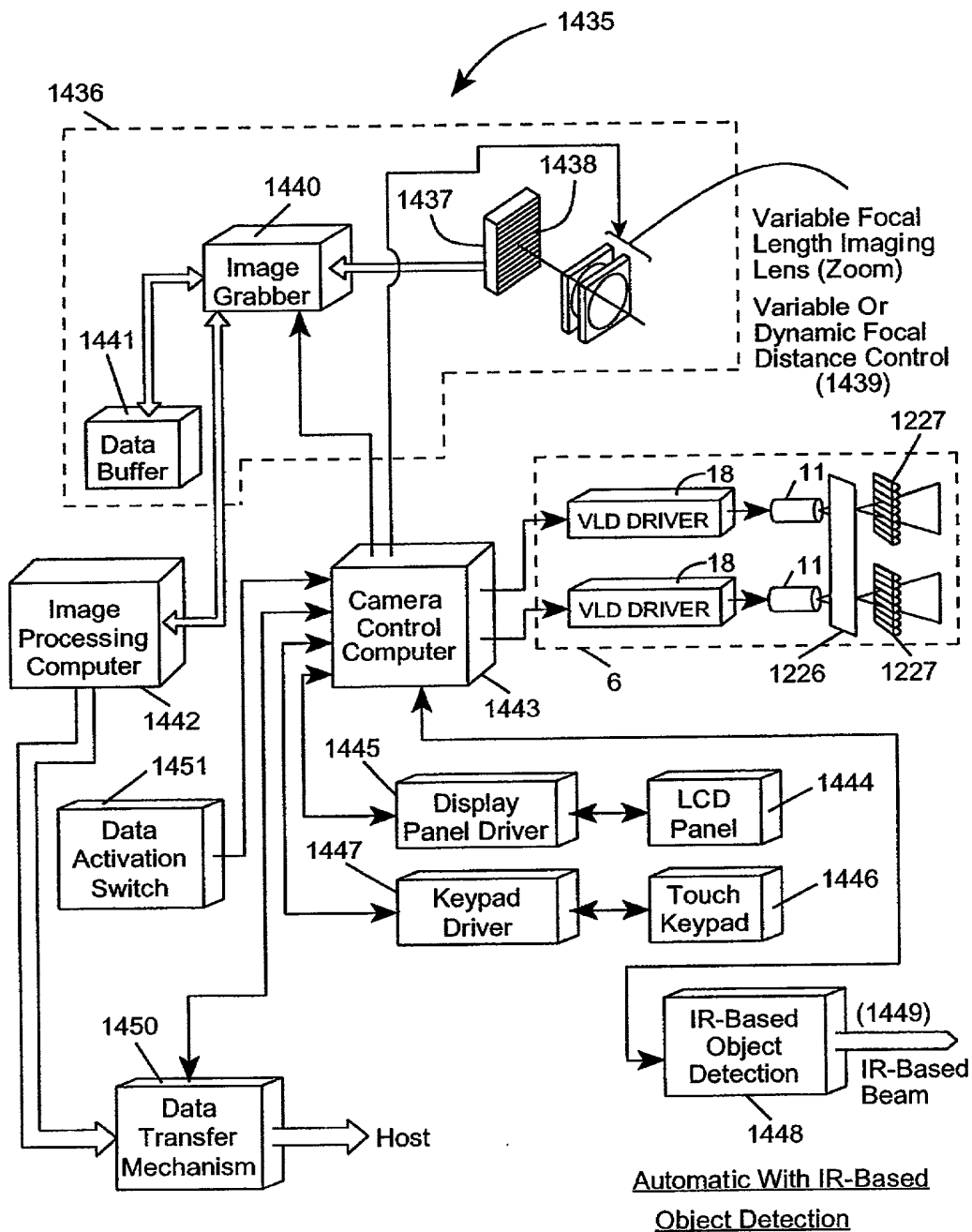


FIG. 40C2

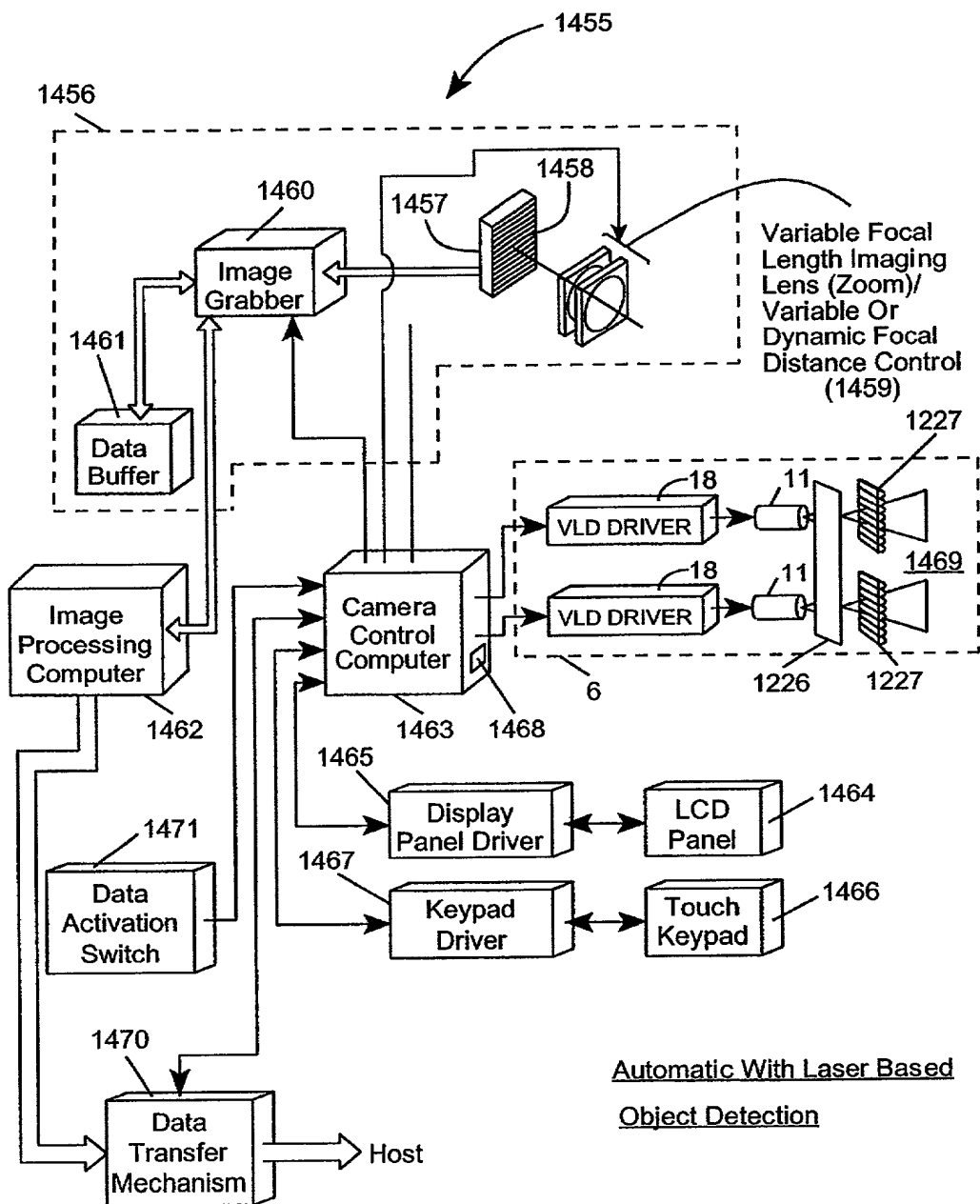


FIG. 40C3

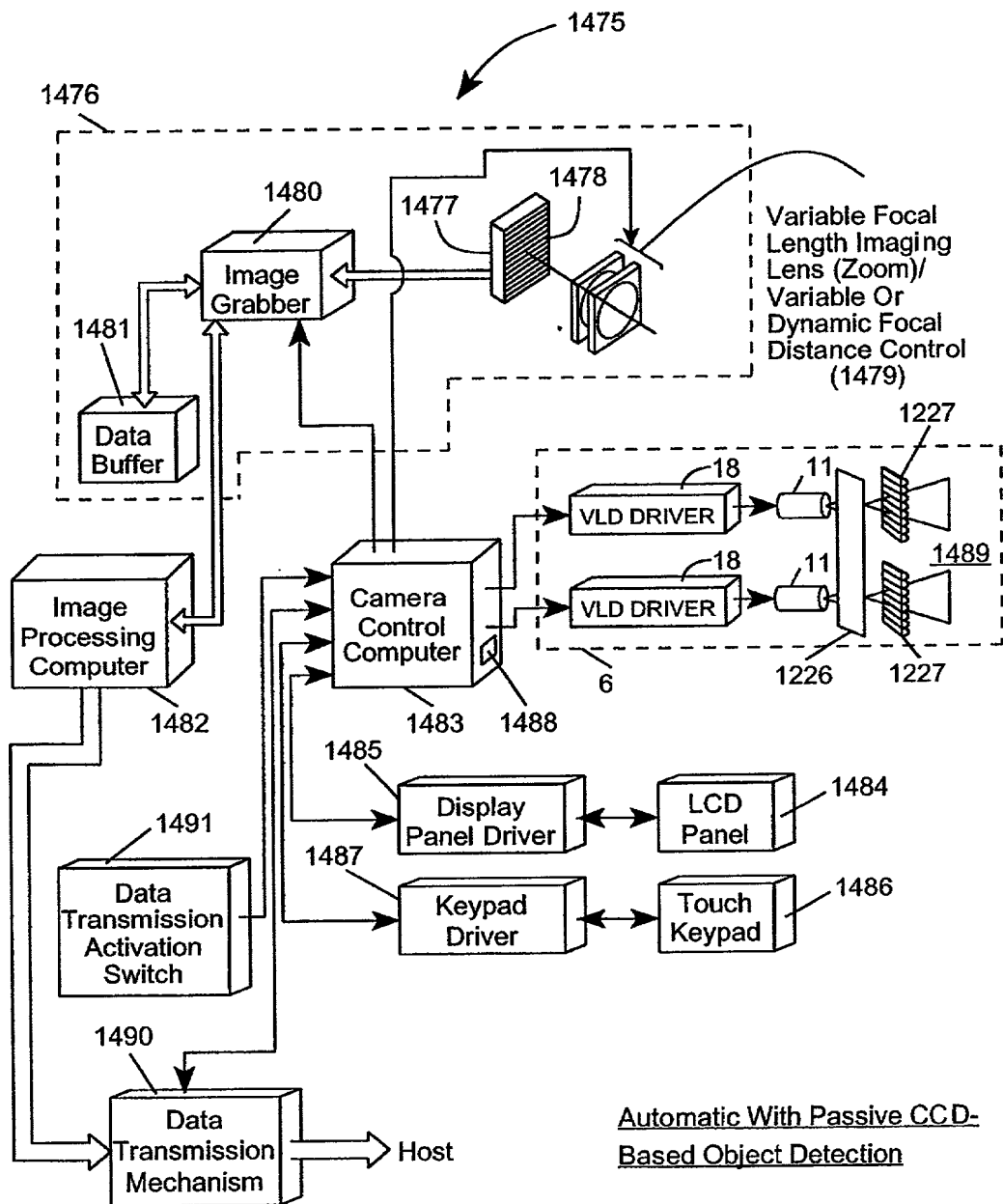


FIG. 40C4

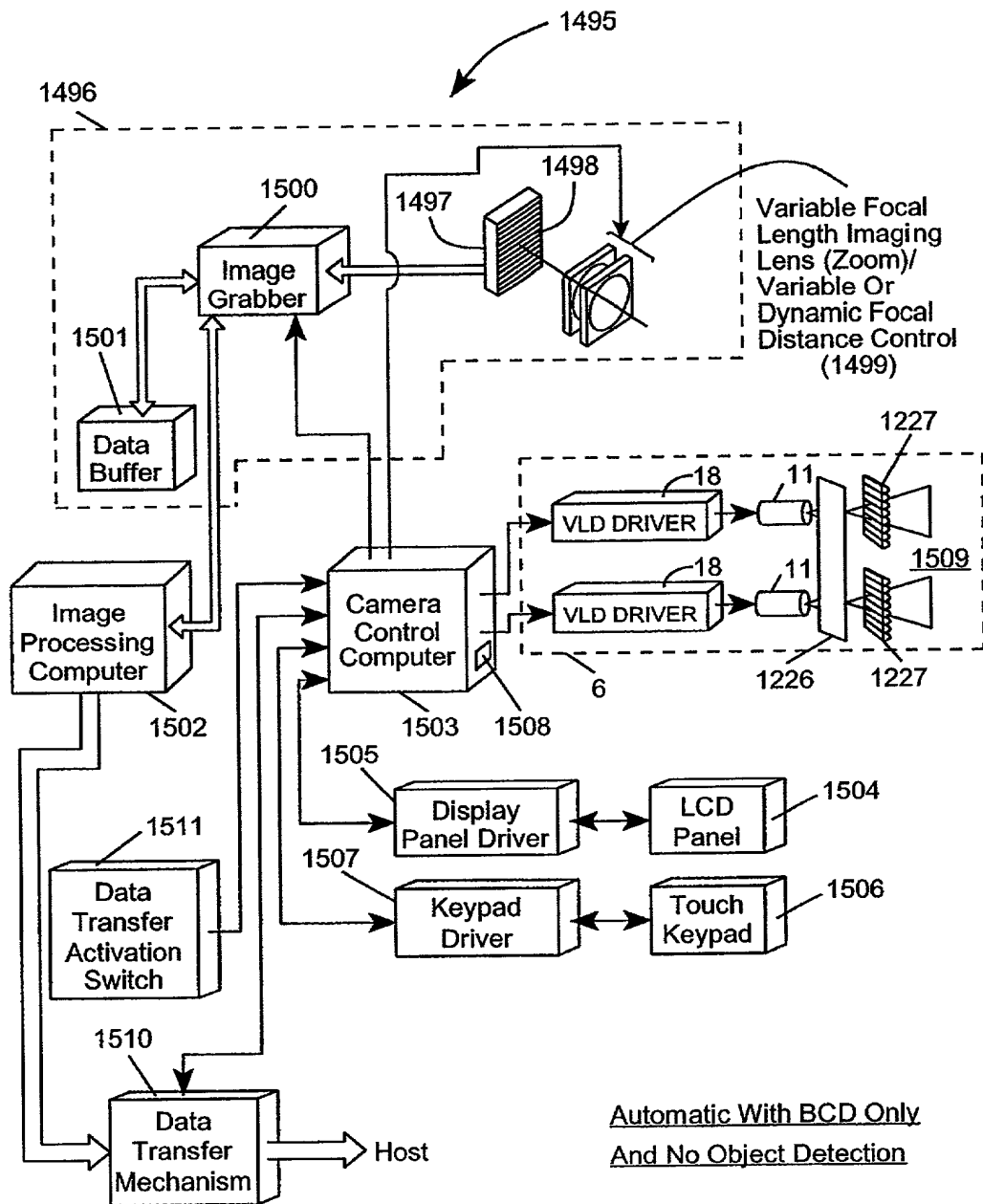


FIG. 40C5

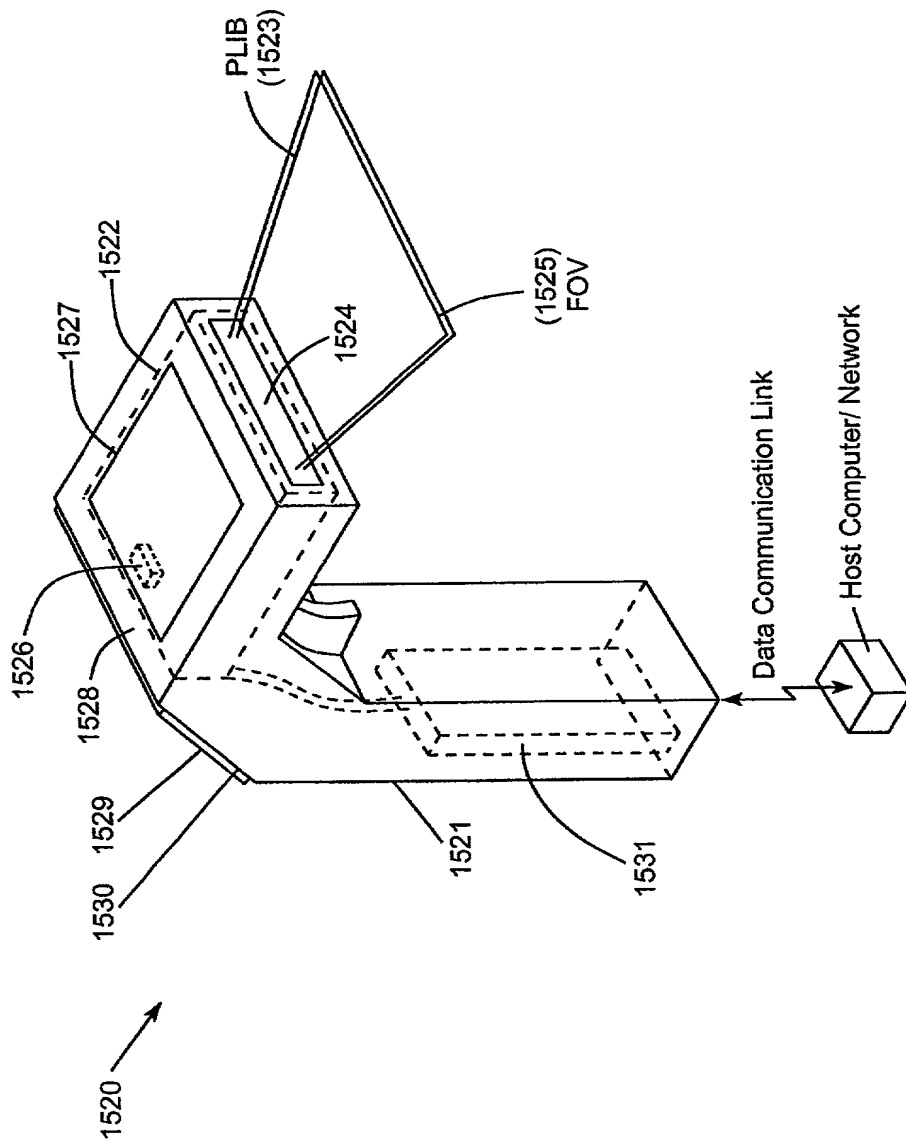


FIG. 41A



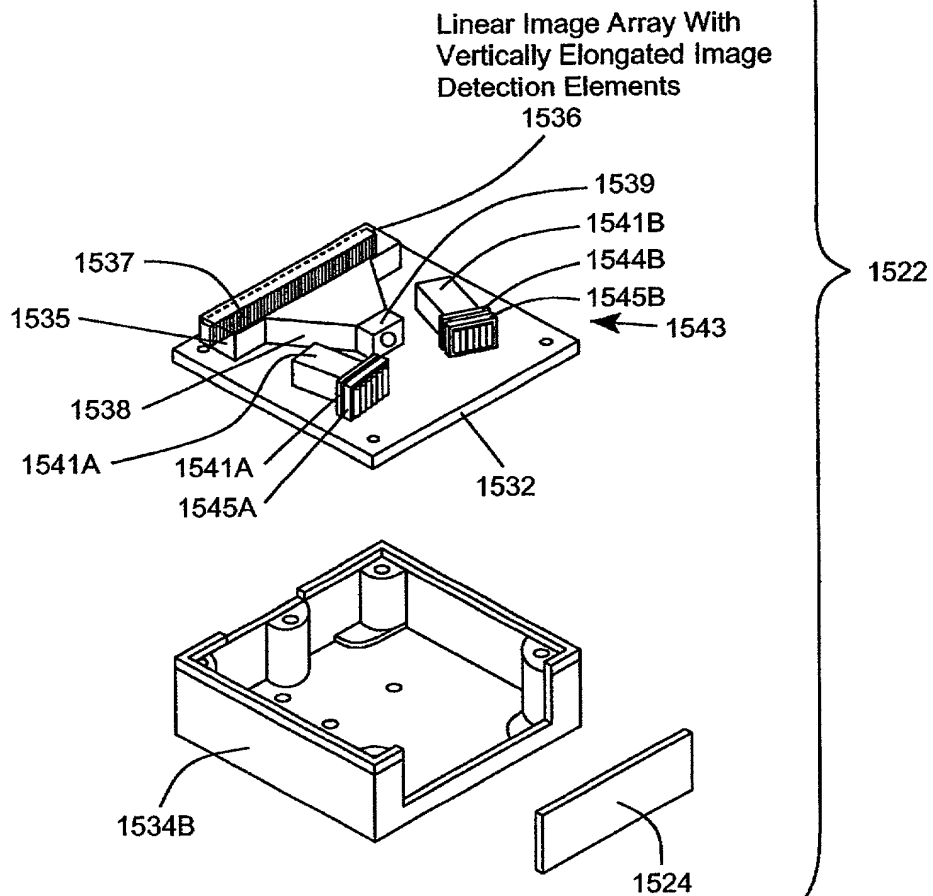
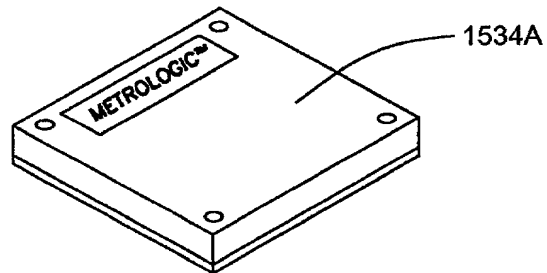


FIG. 41B

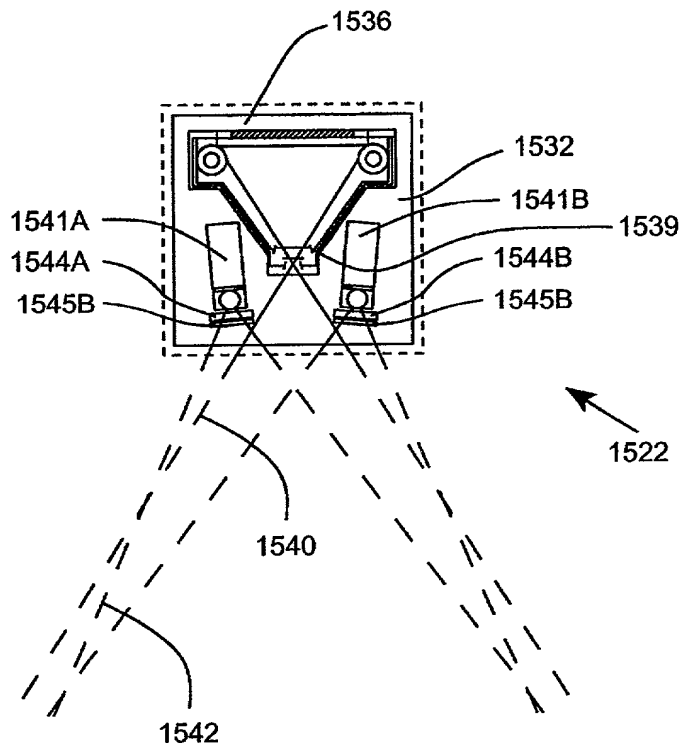


FIG. 41C

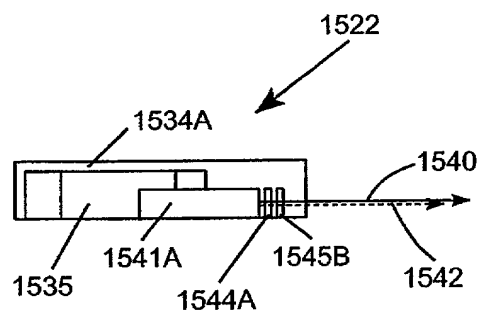


FIG. 41D

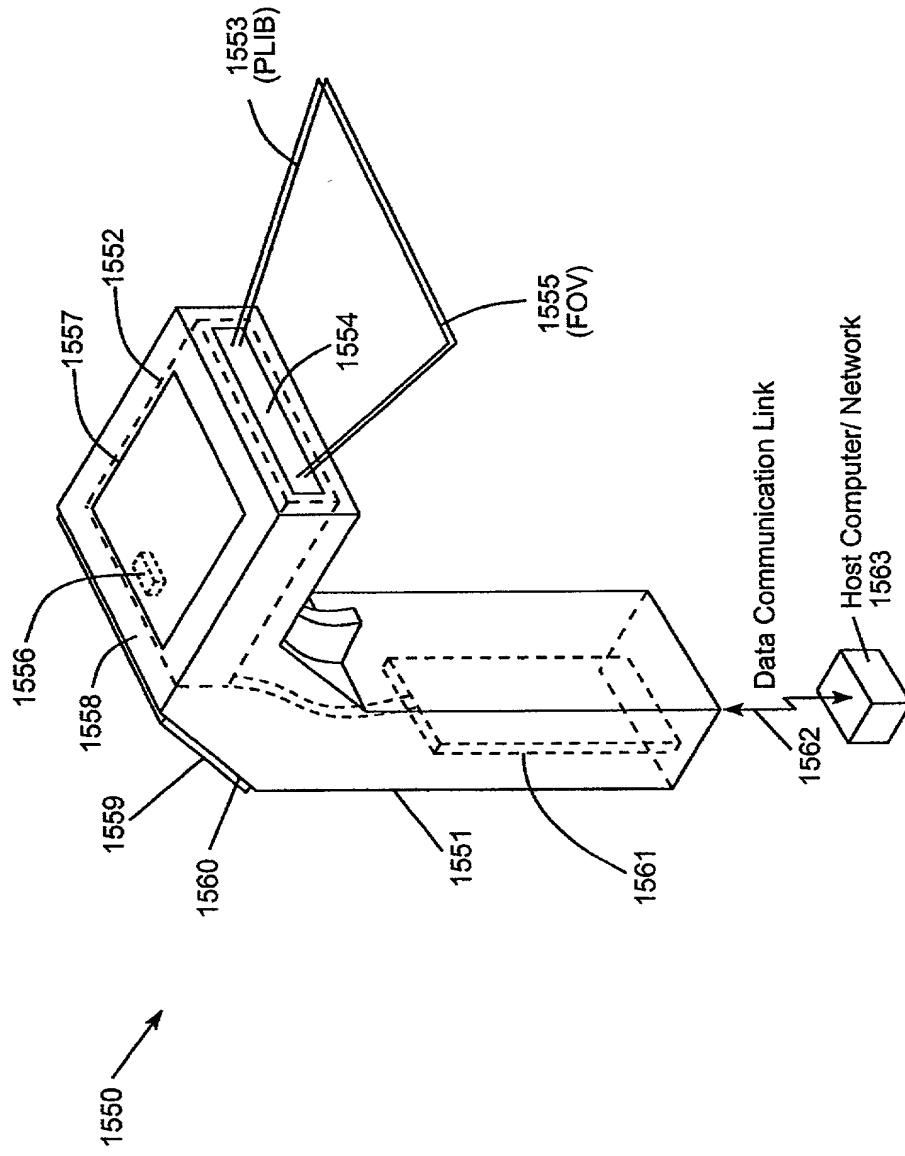


FIG. 42A

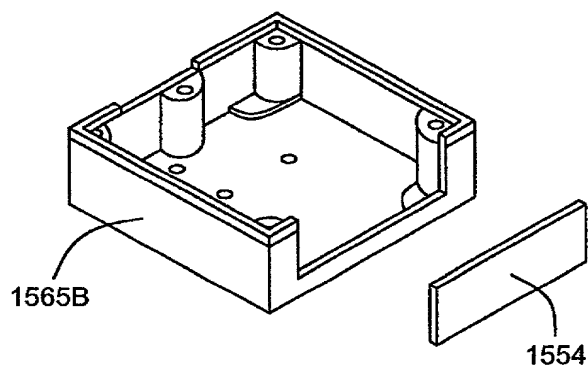
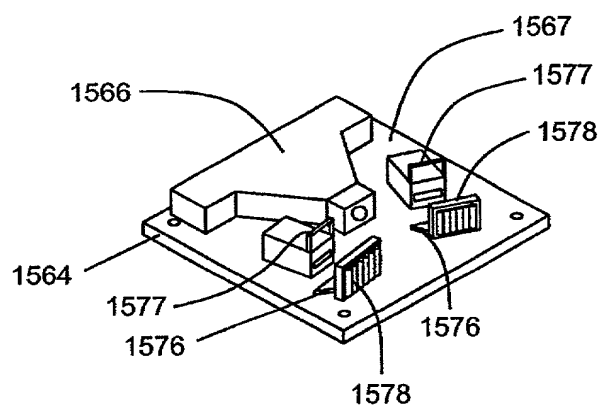
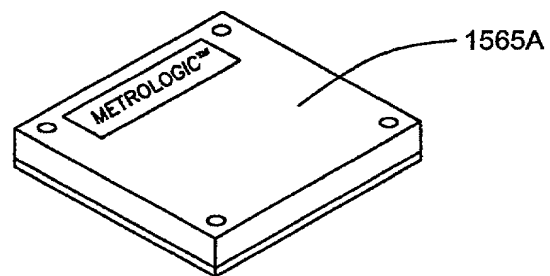


FIG. 42B

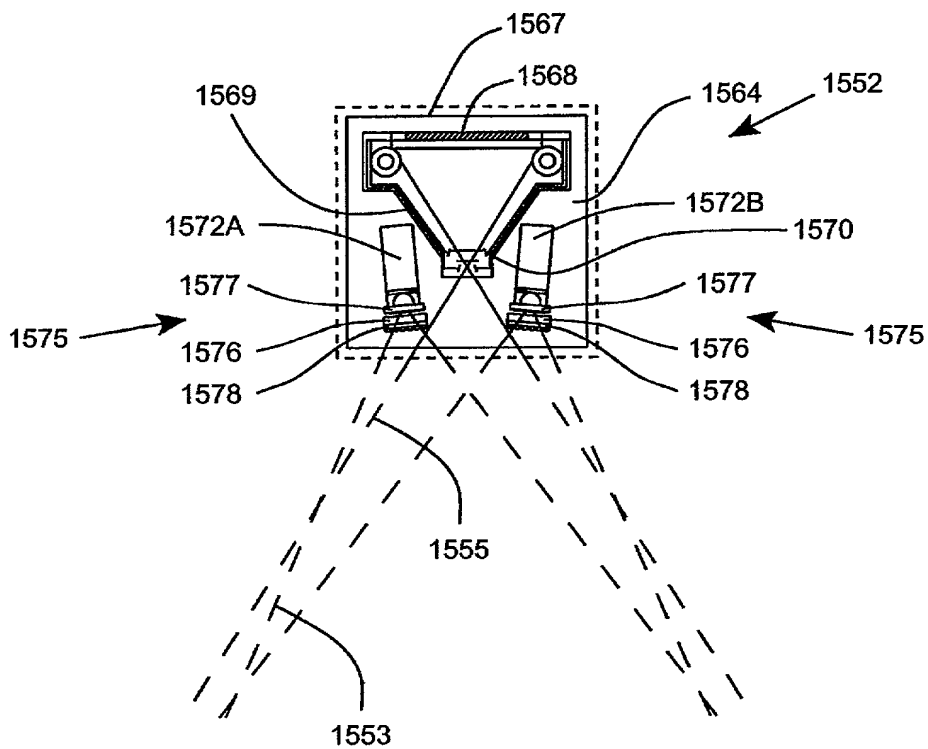


FIG. 42C

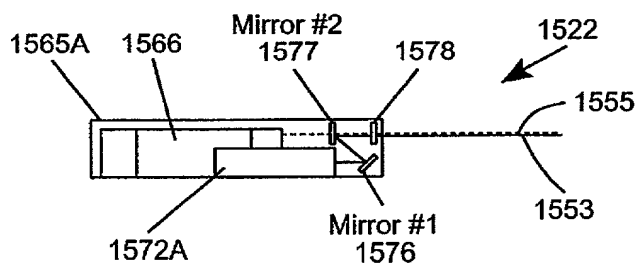


FIG. 42D

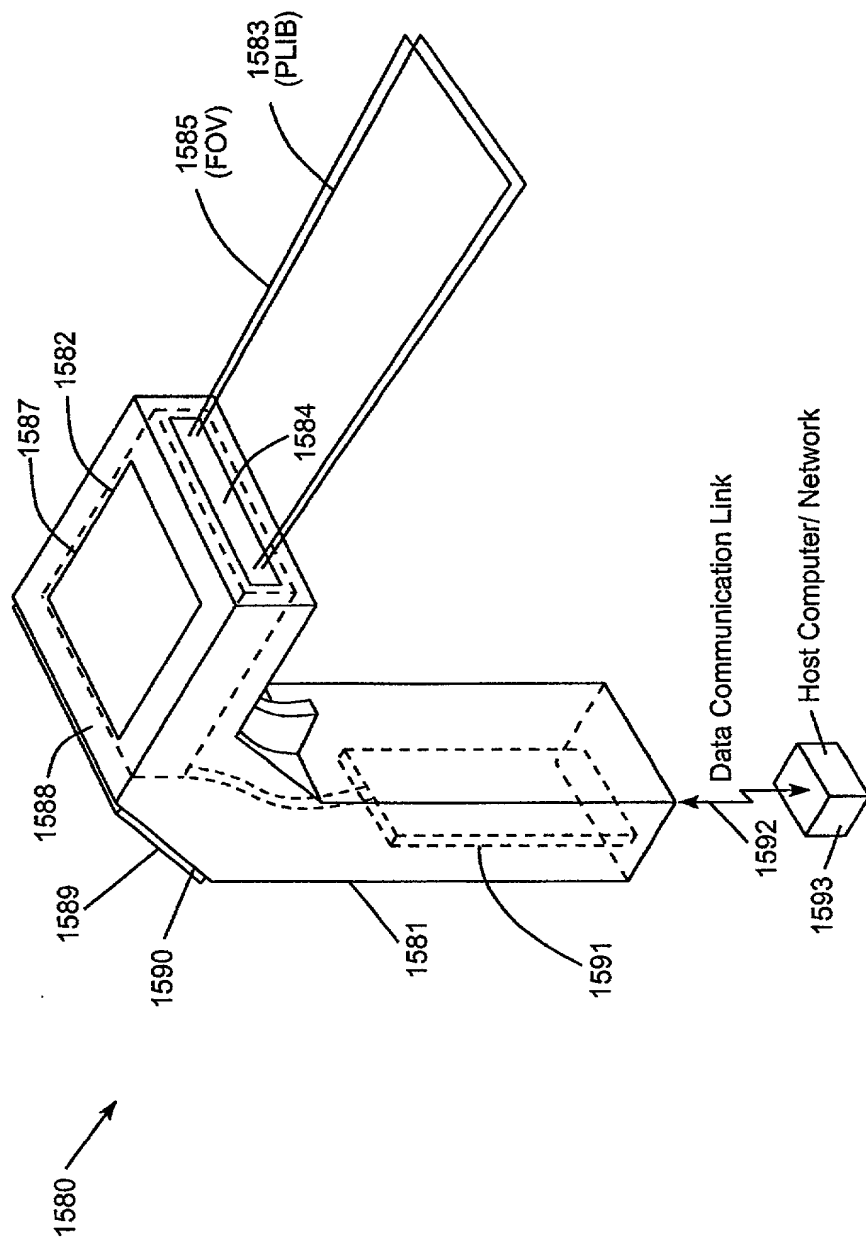


FIG. 43A

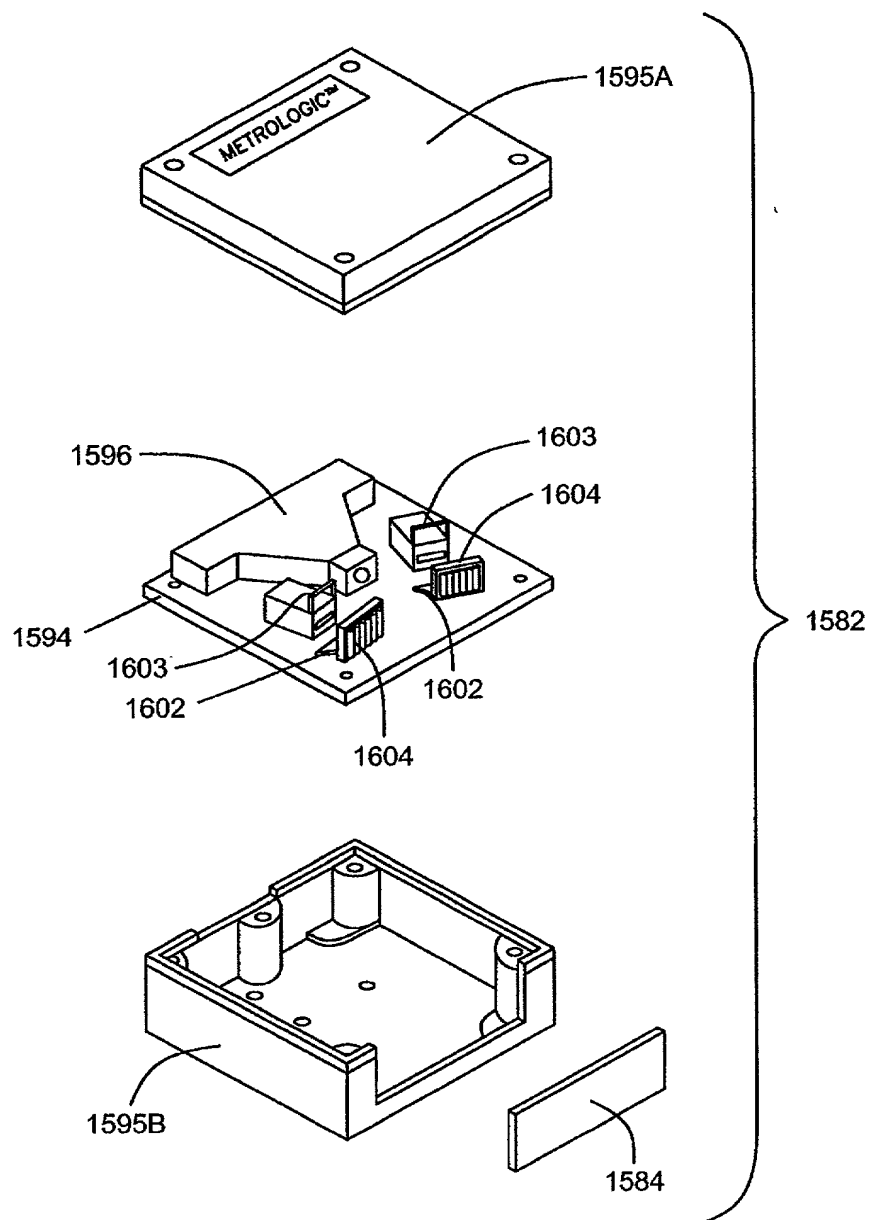


FIG. 43B

“0452300” of 0452300

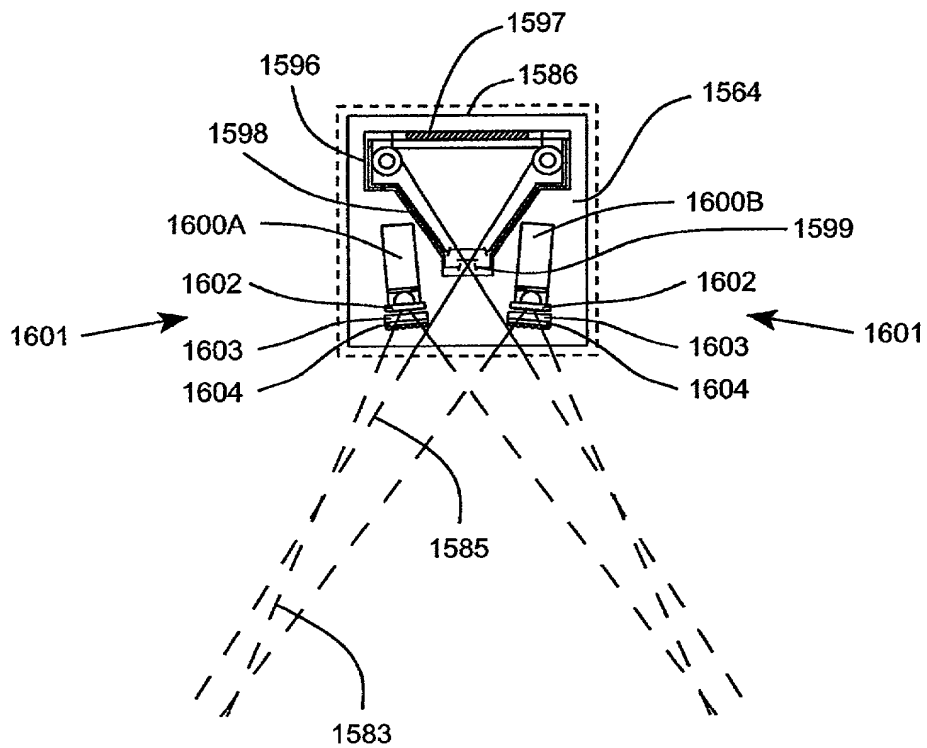


FIG. 43C

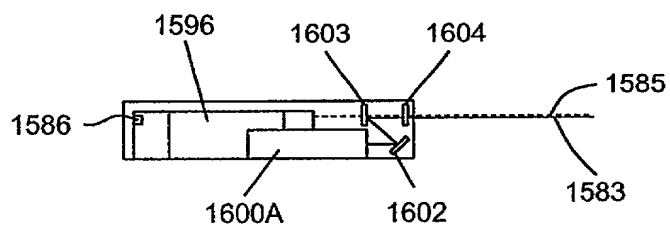


FIG. 43D



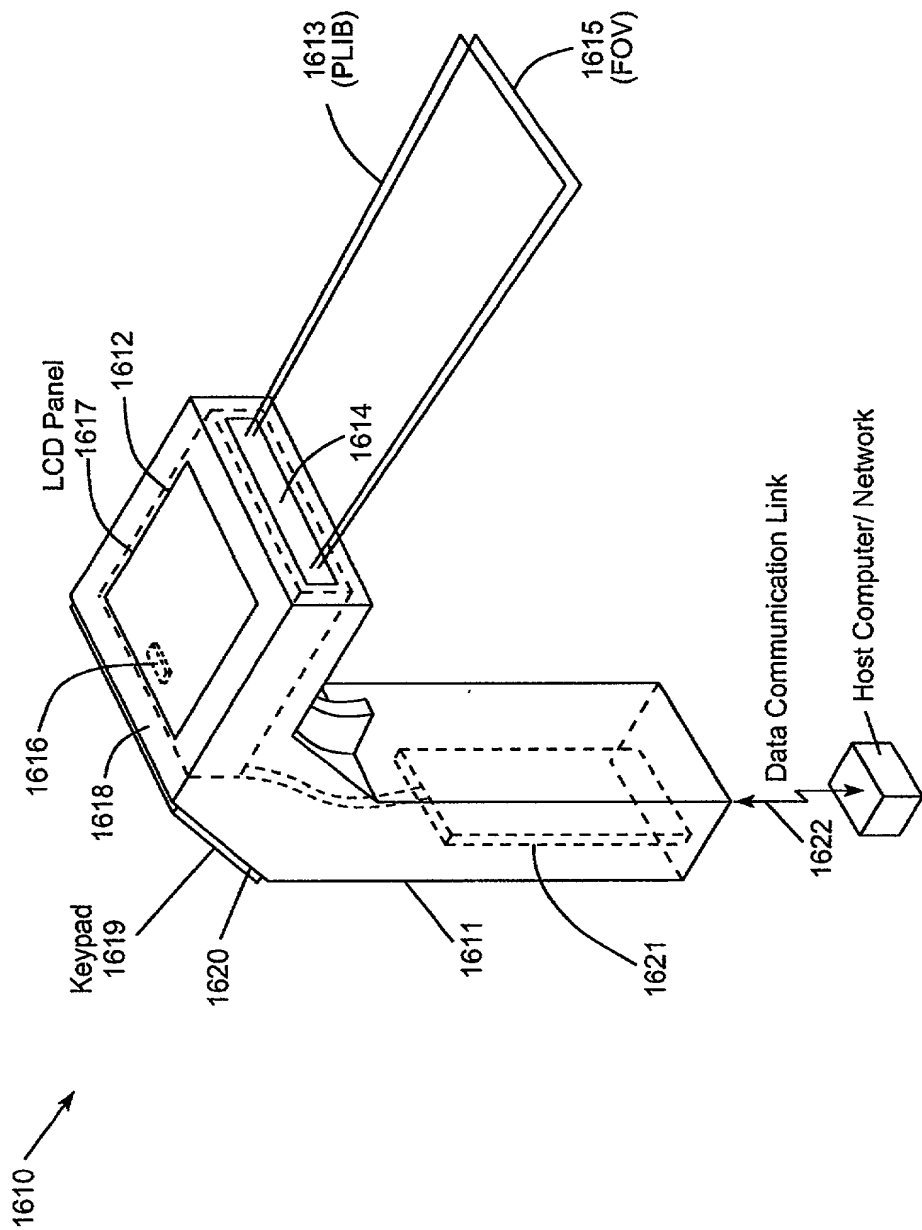


FIG. 44A

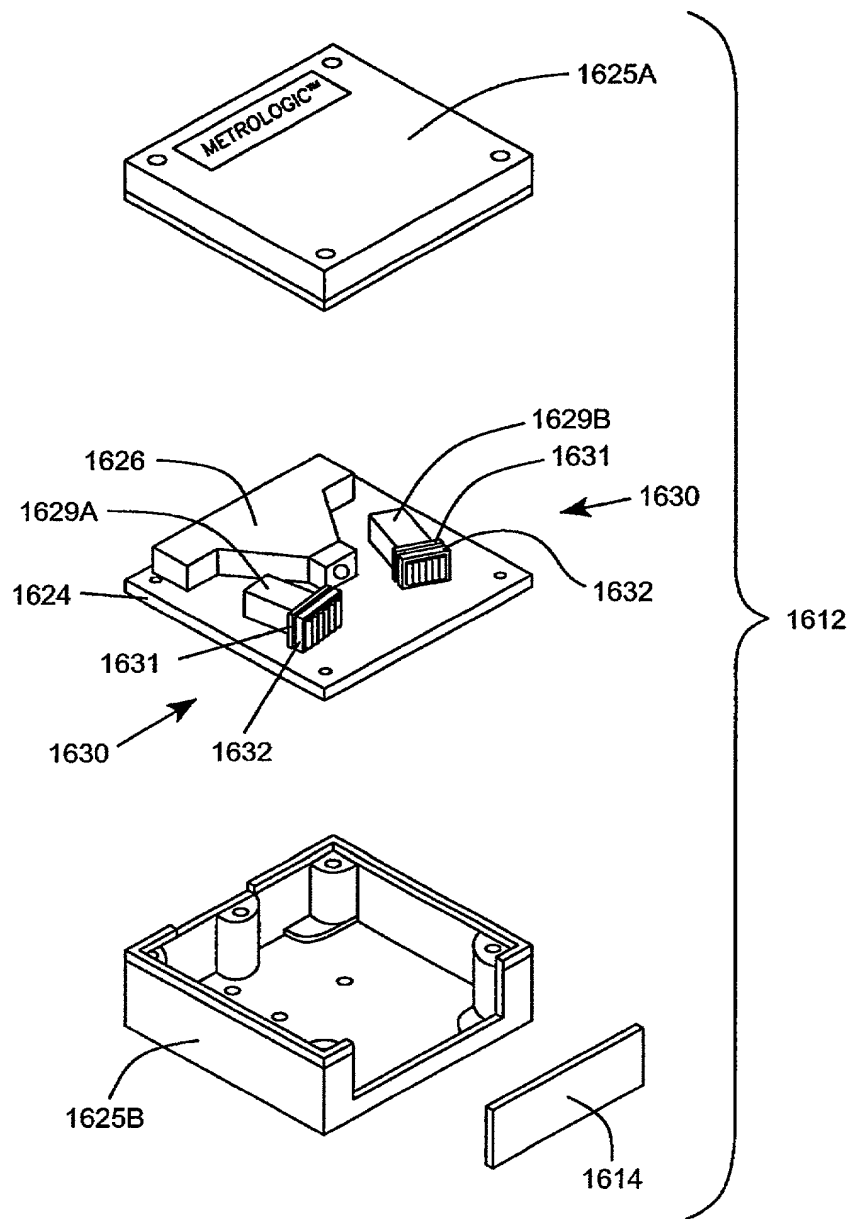


FIG. 44B

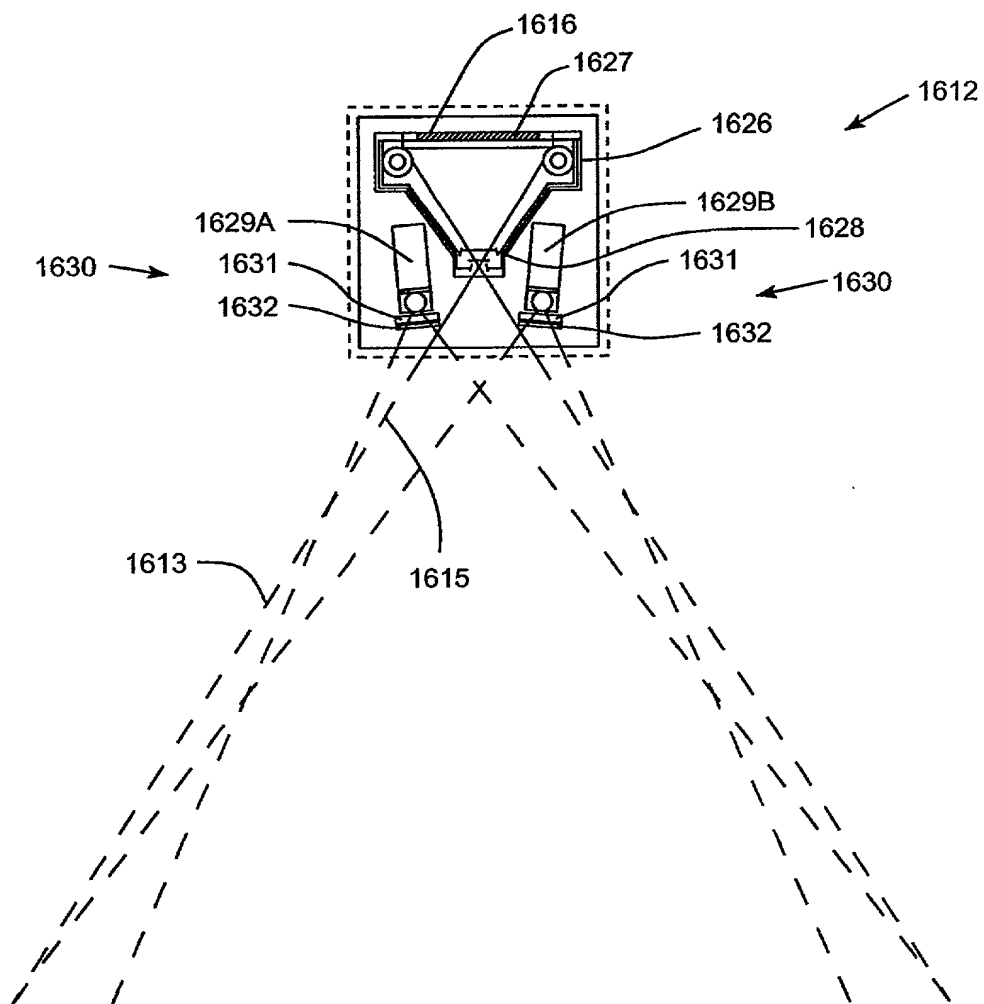


FIG. 44C

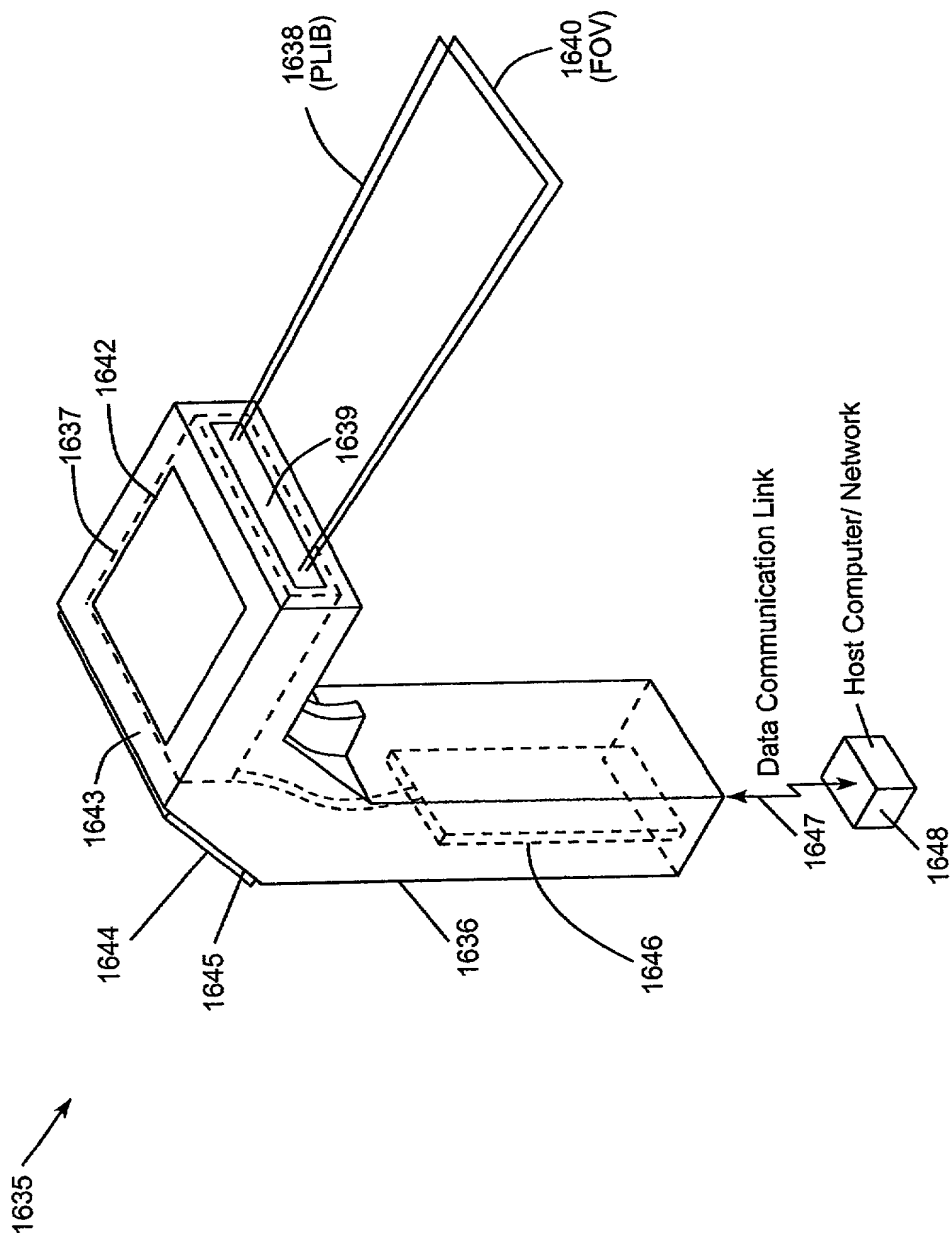


FIG. 45A

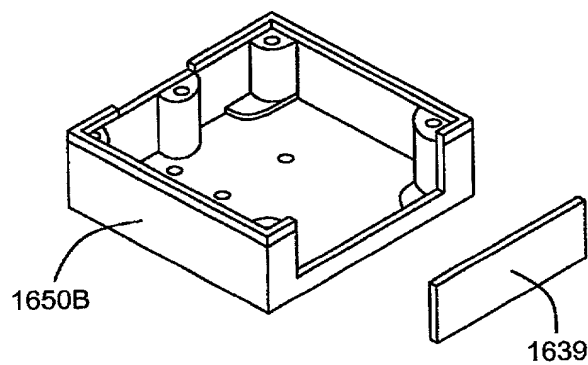
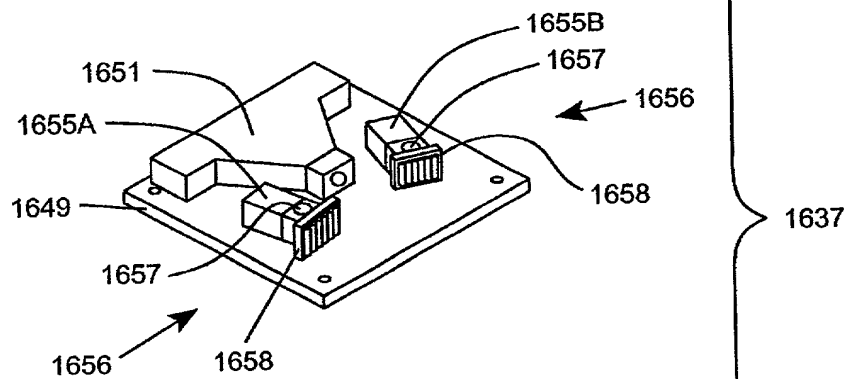
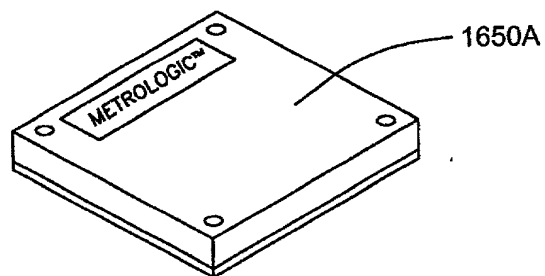


FIG. 45B

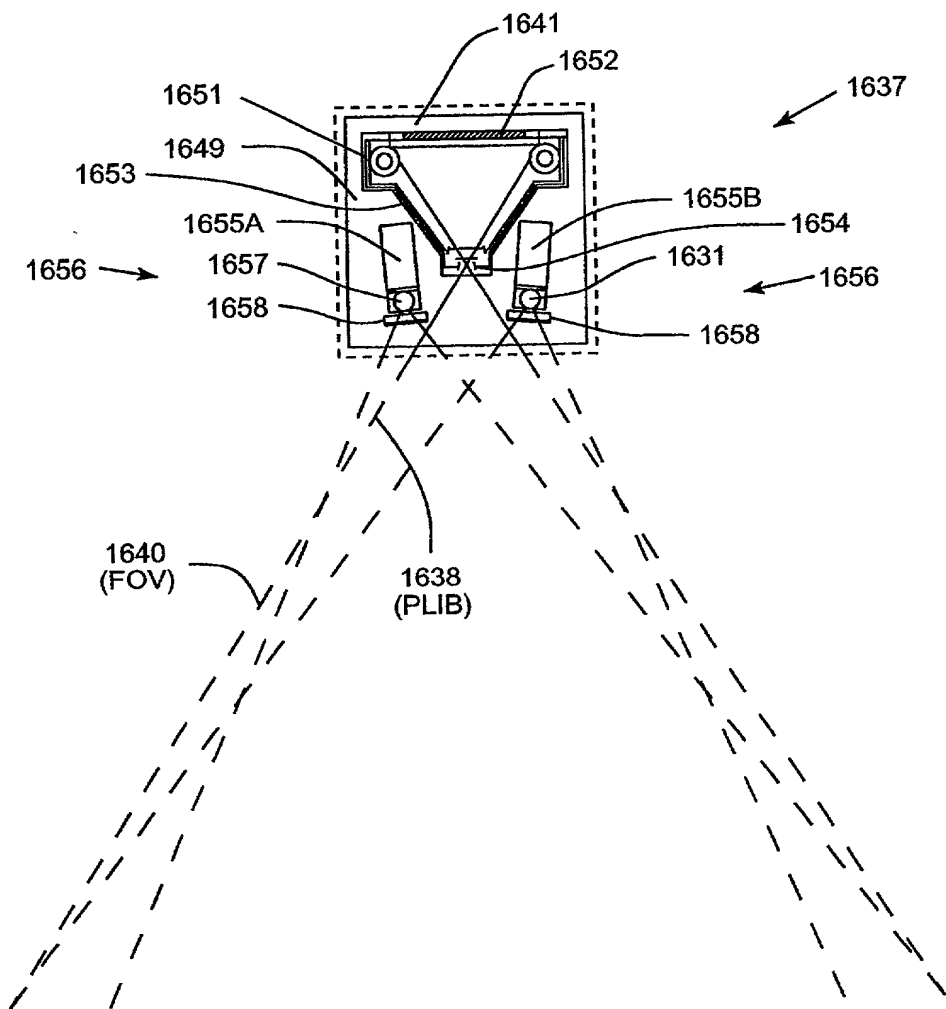


FIG. 45C

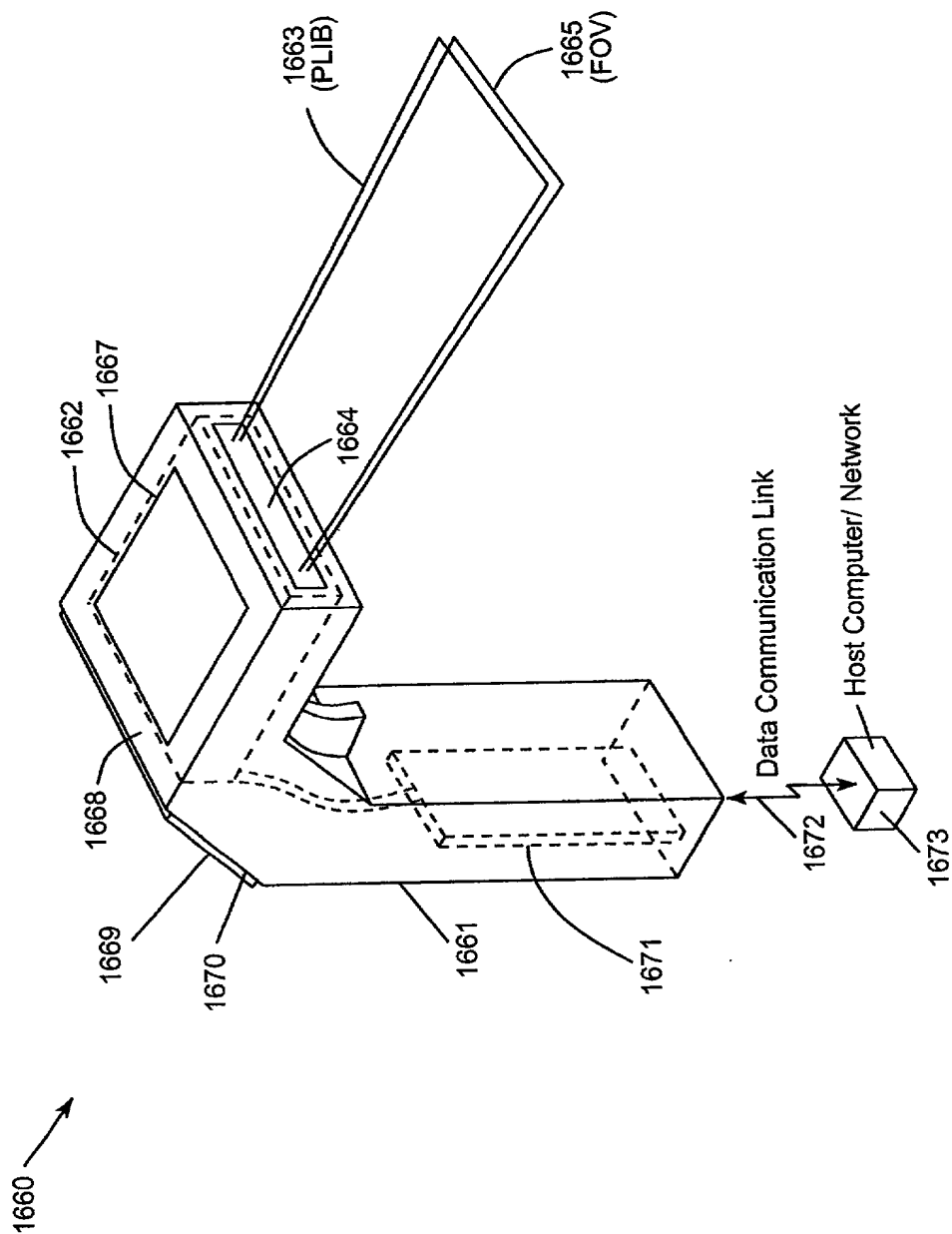


FIG. 46A

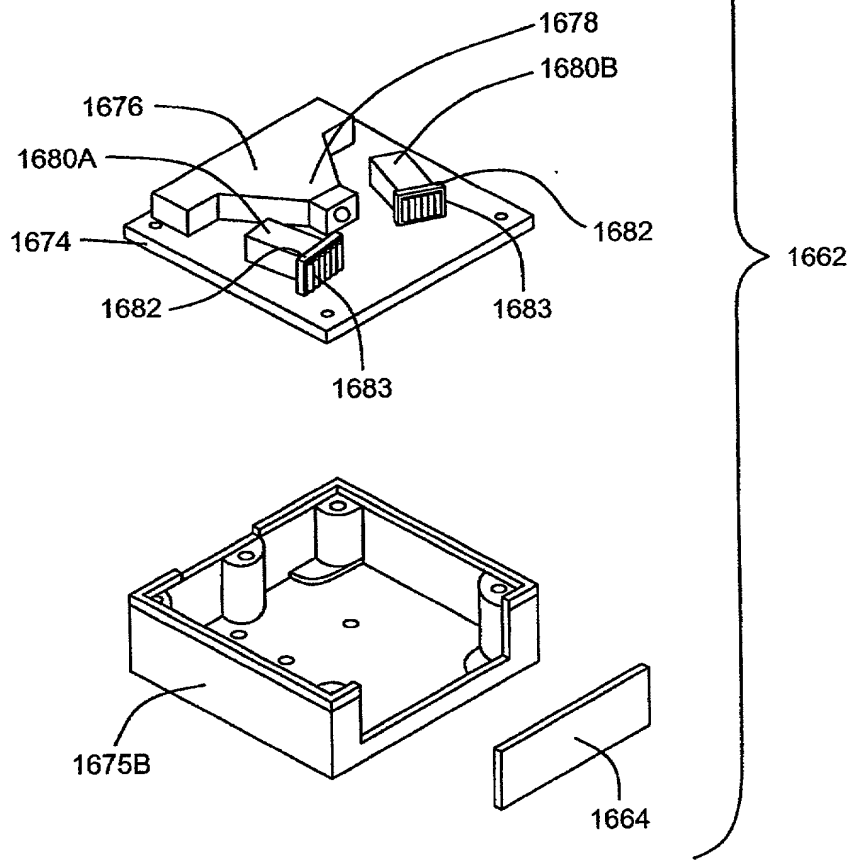
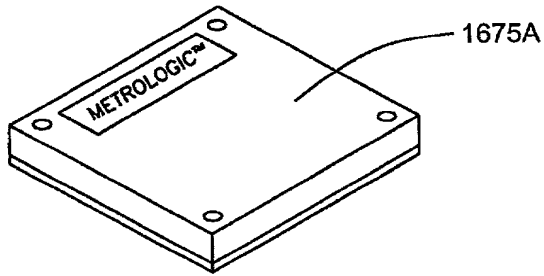


FIG. 46B



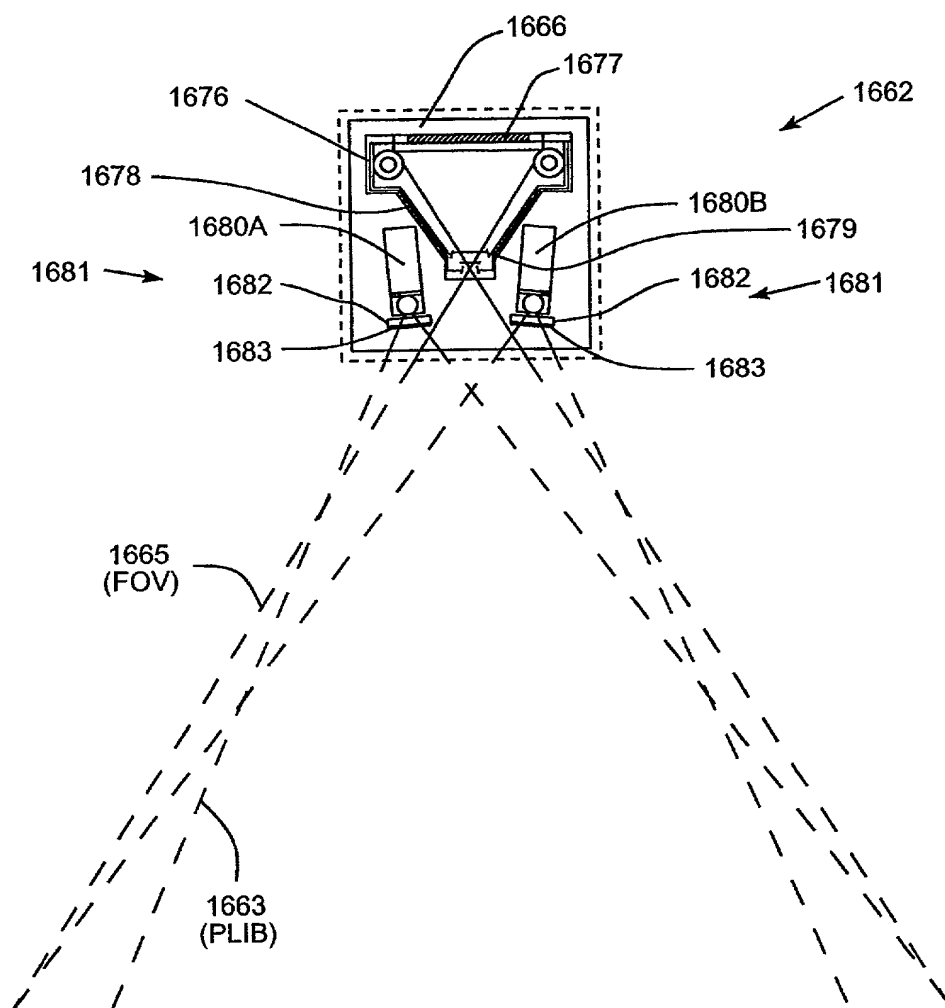


FIG. 46C

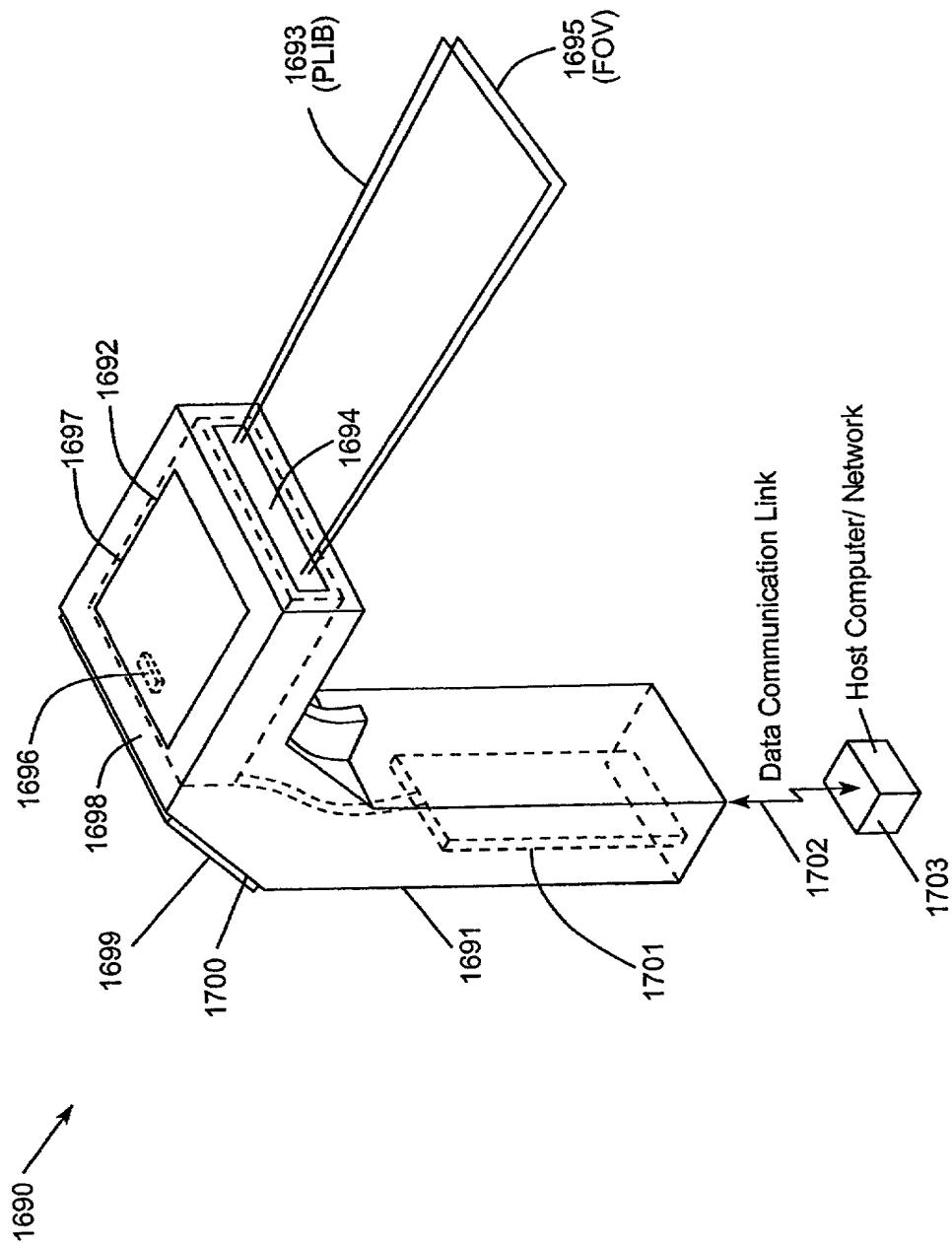


FIG. 47A

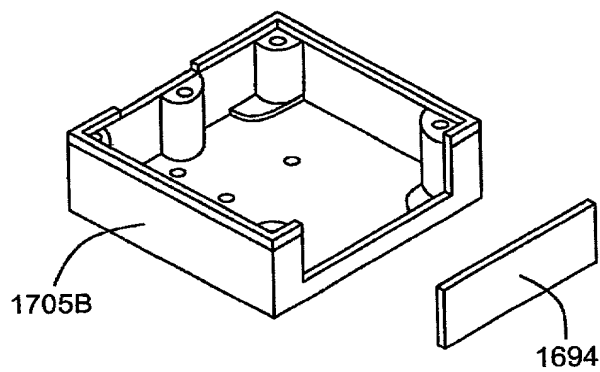
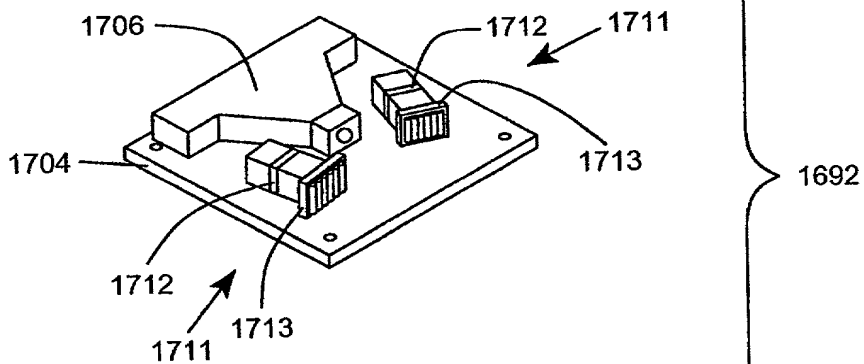
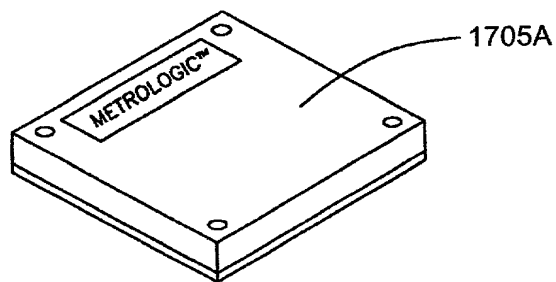


FIG. 47B

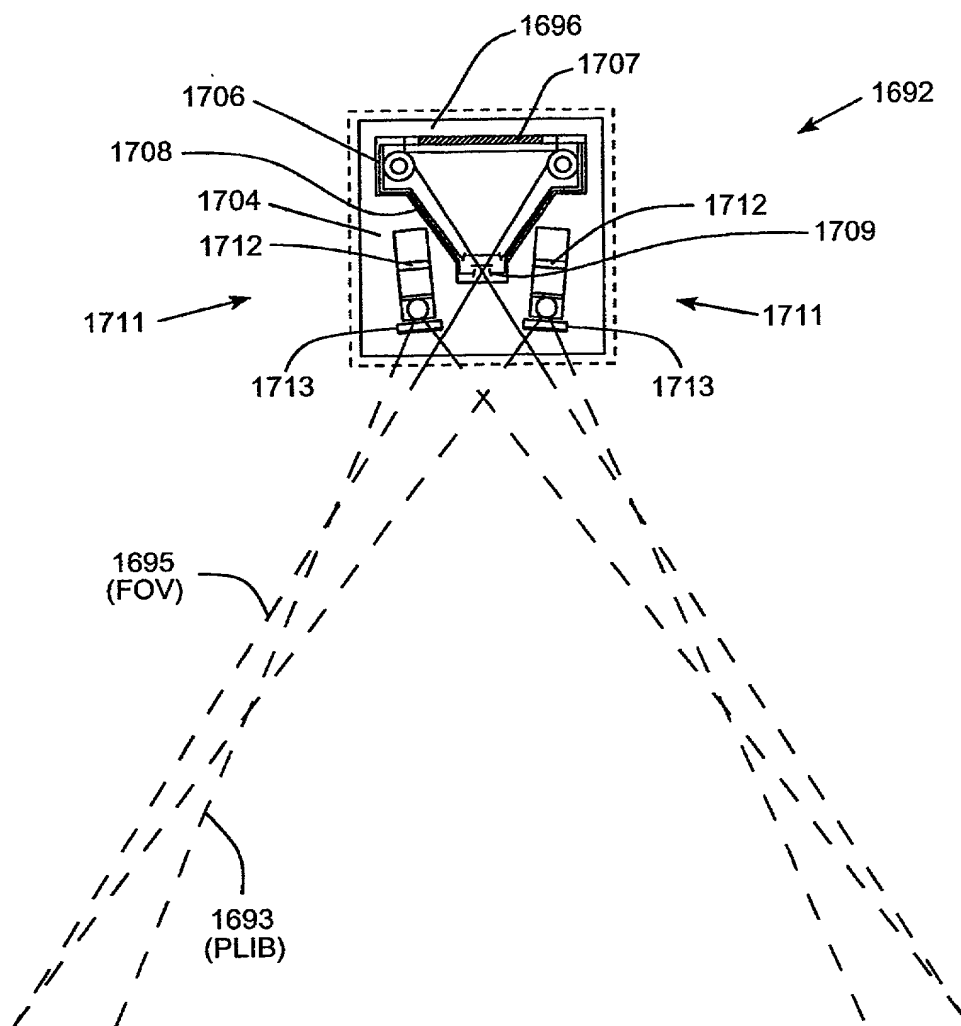


FIG. 47C

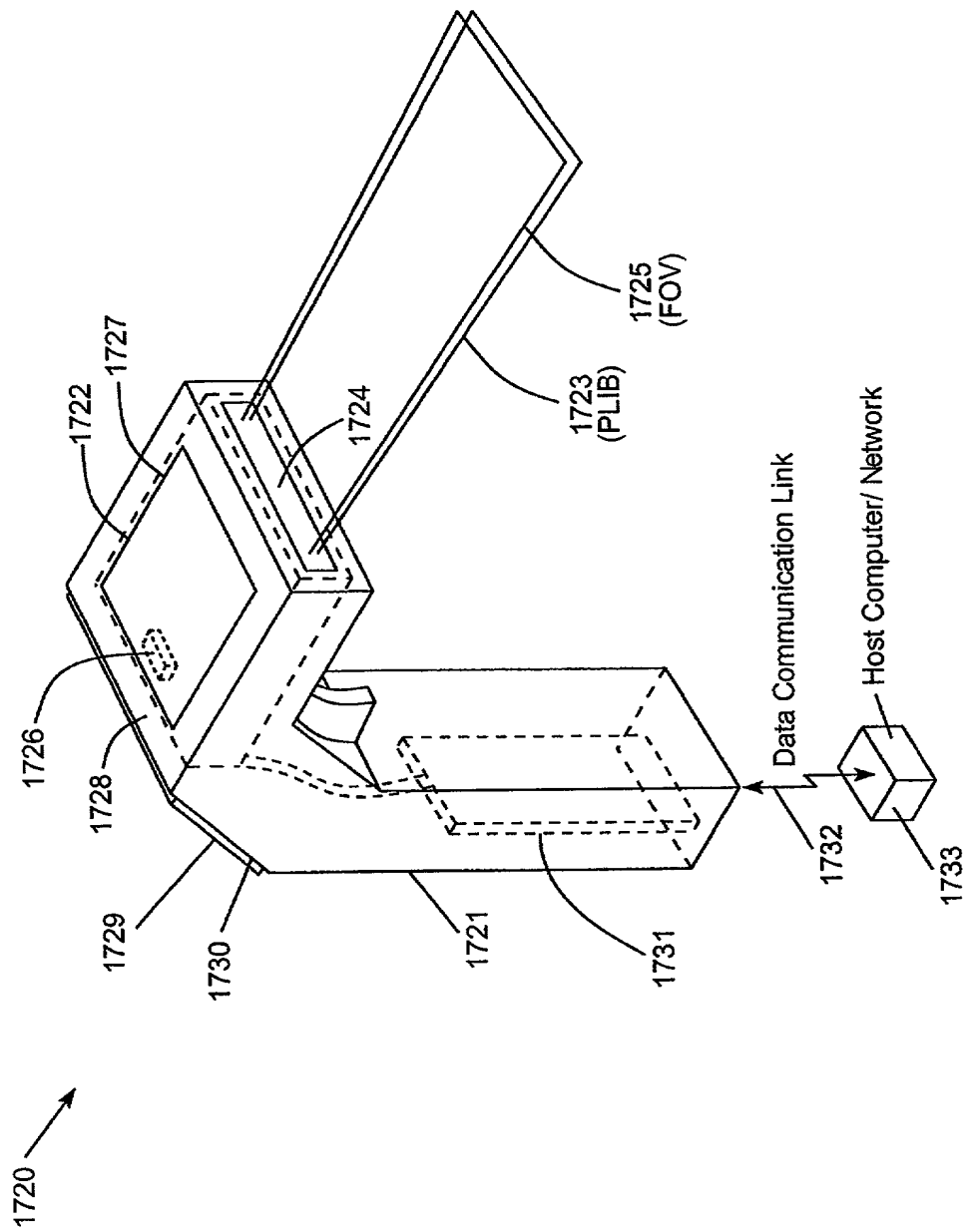


FIG. 48A

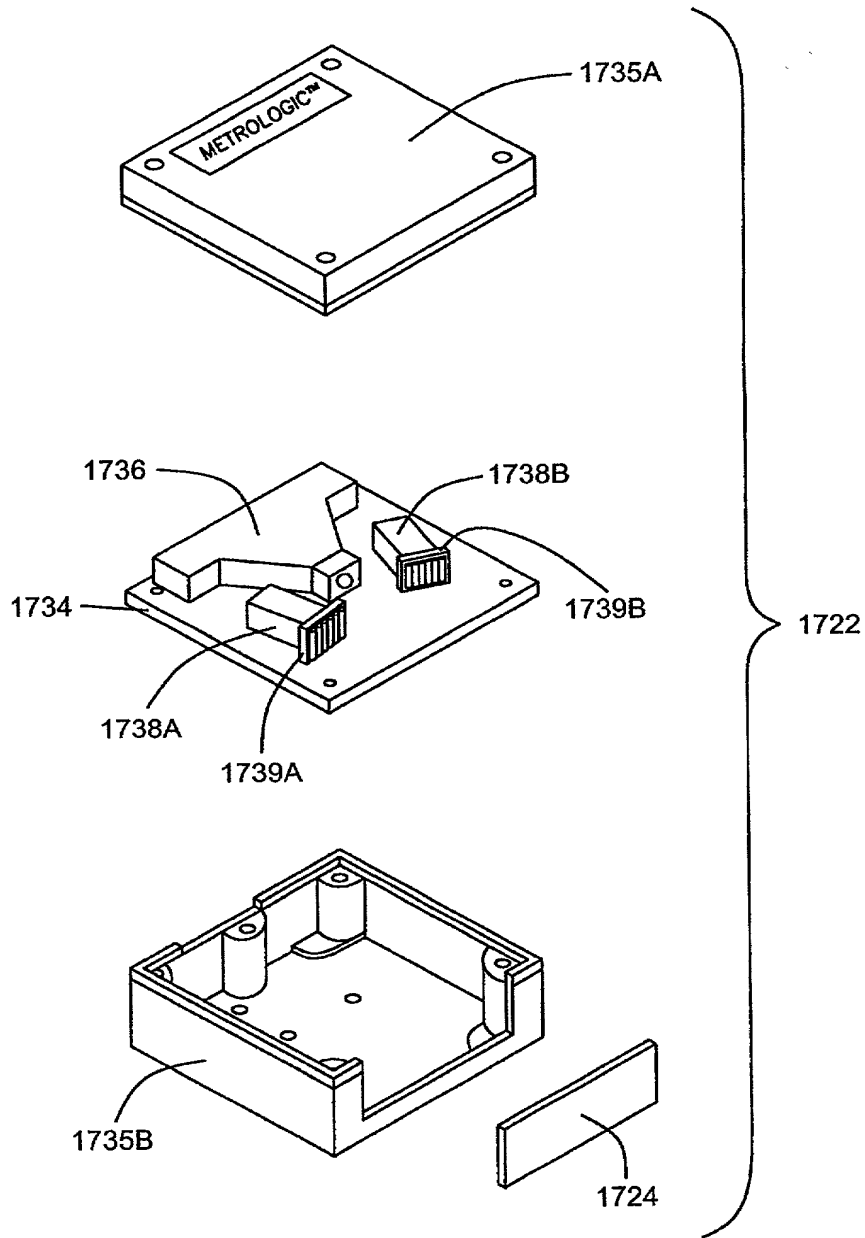


FIG. 48B

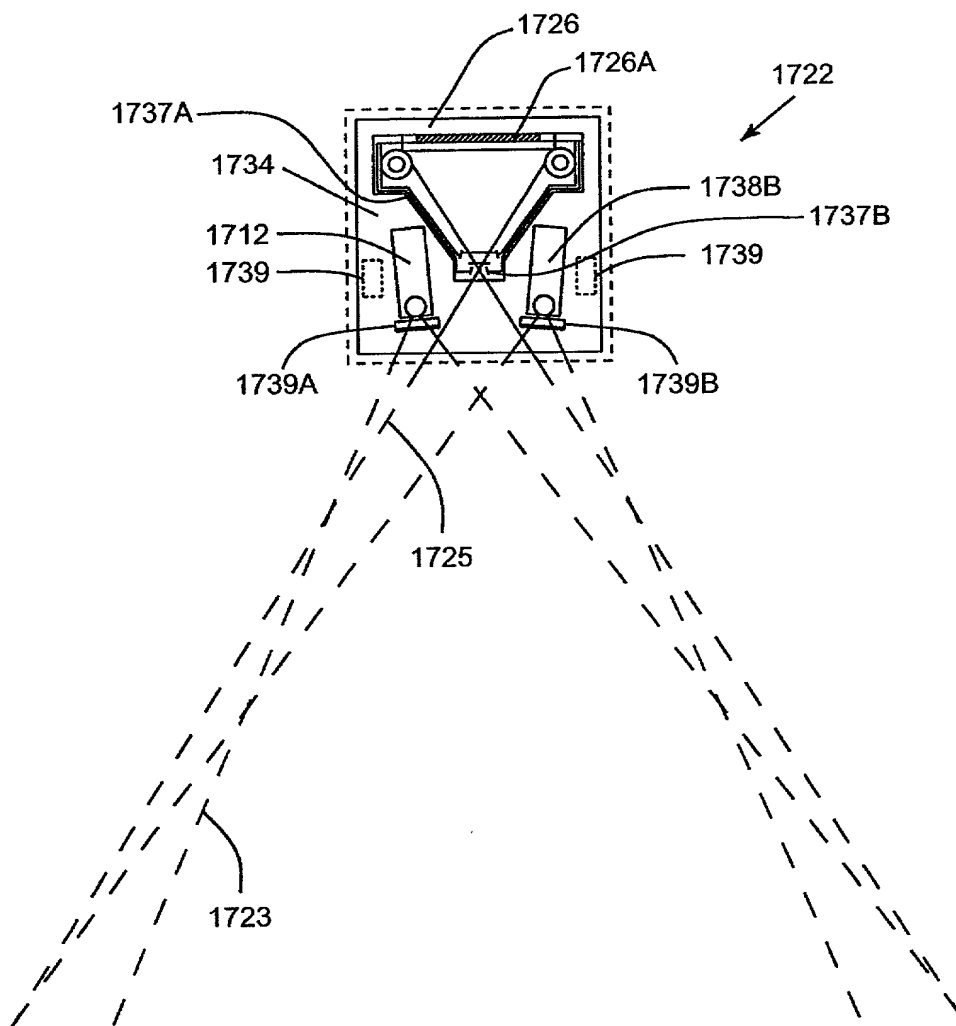


FIG. 48C

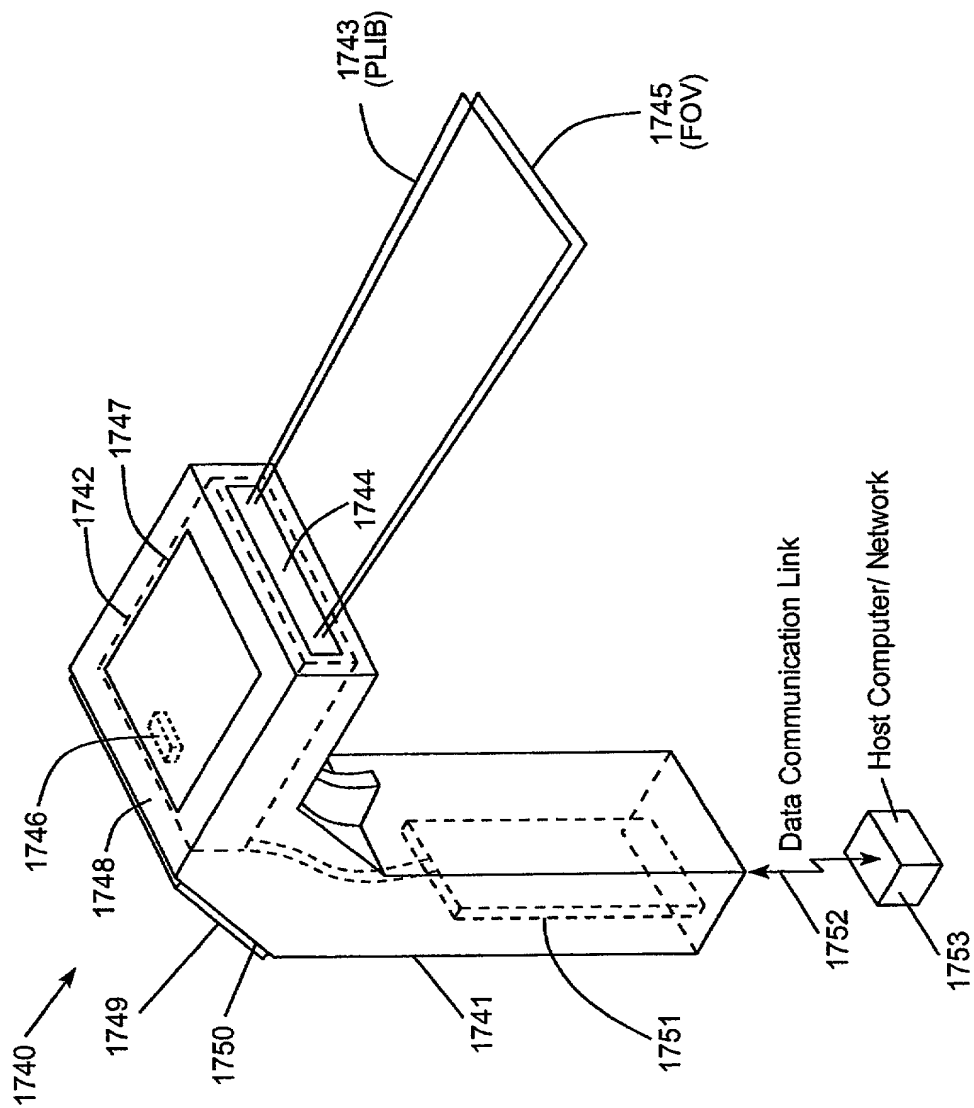


FIG. 49A



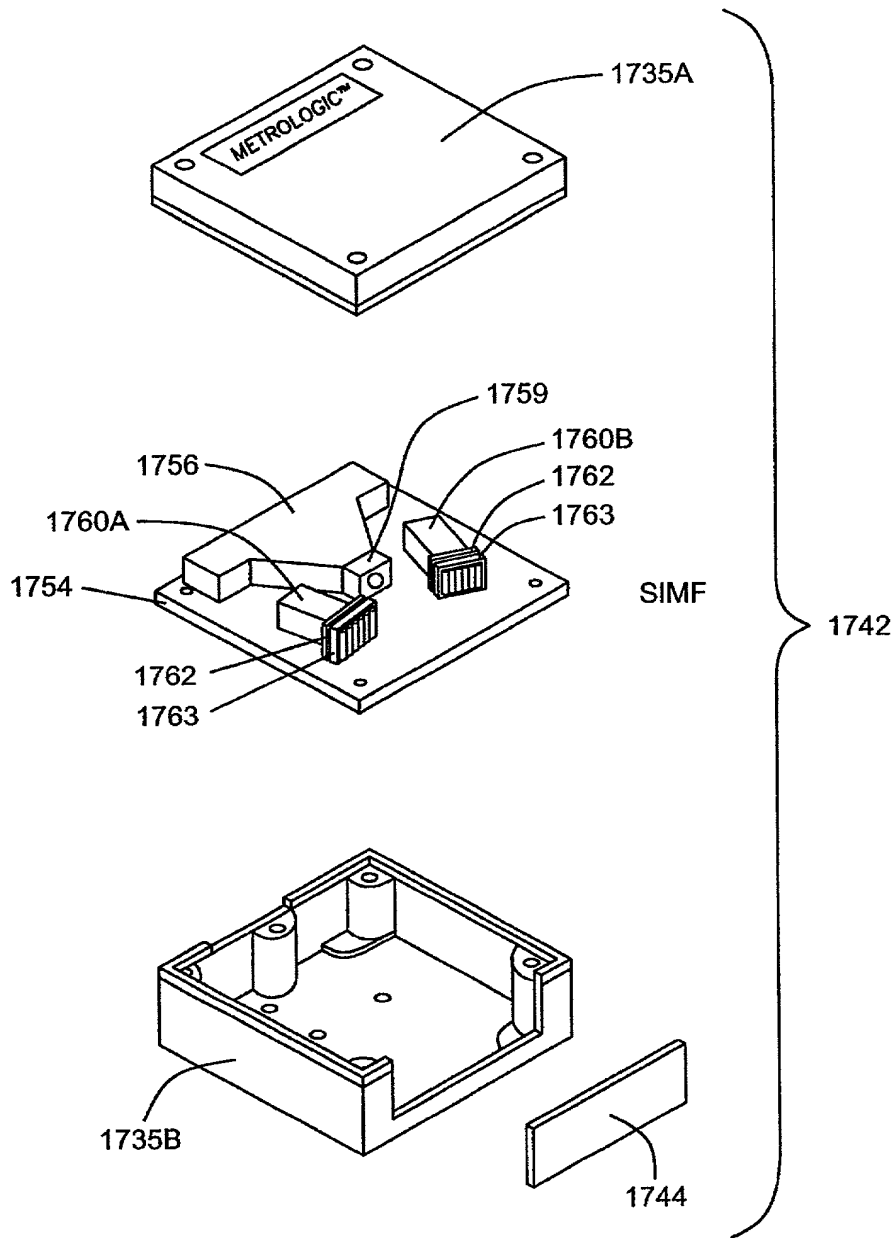


FIG. 49B



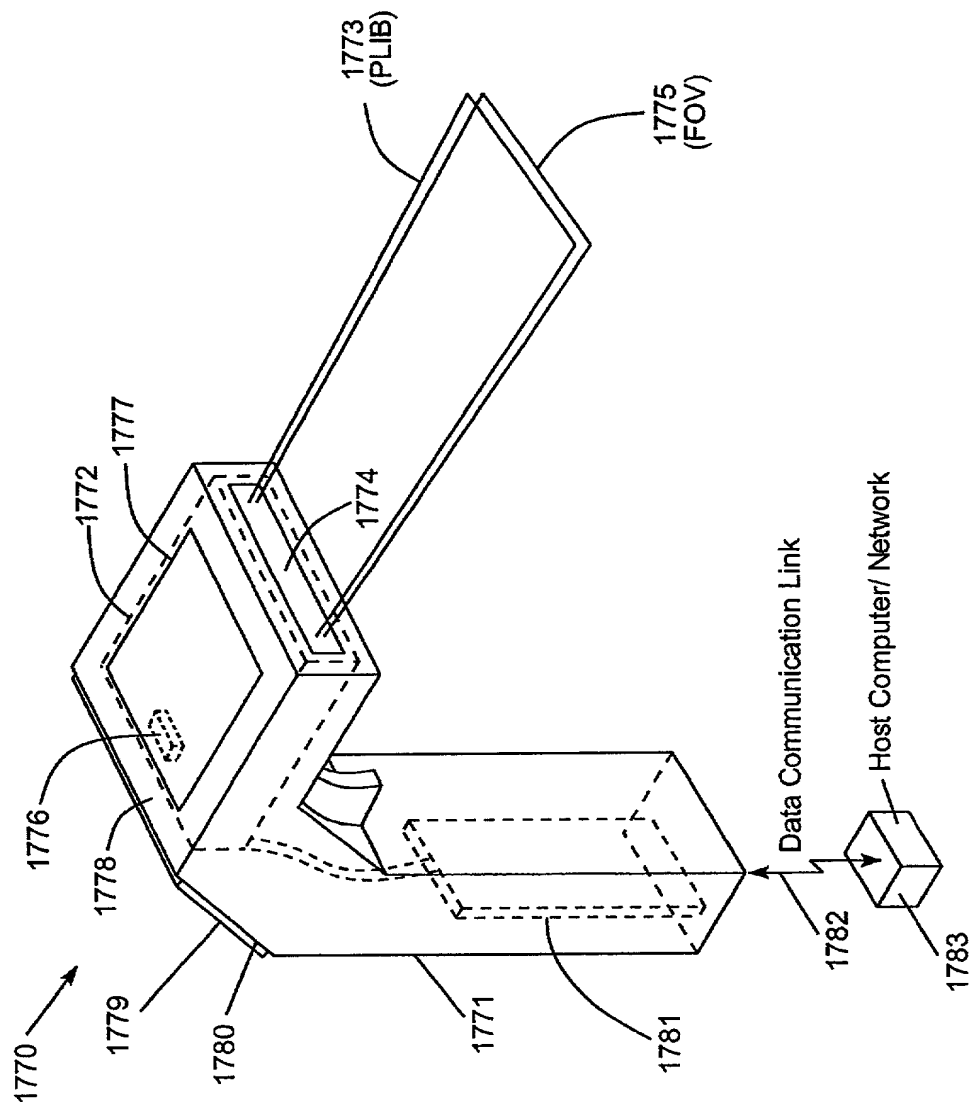


FIG. 50A

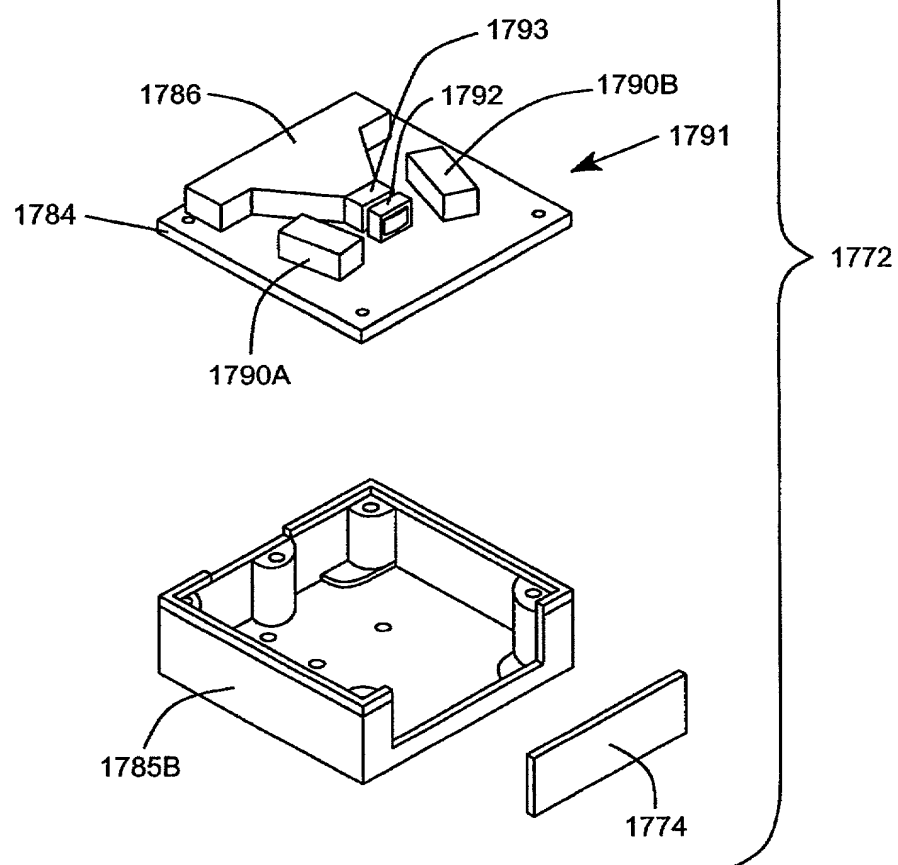


FIG. 50B

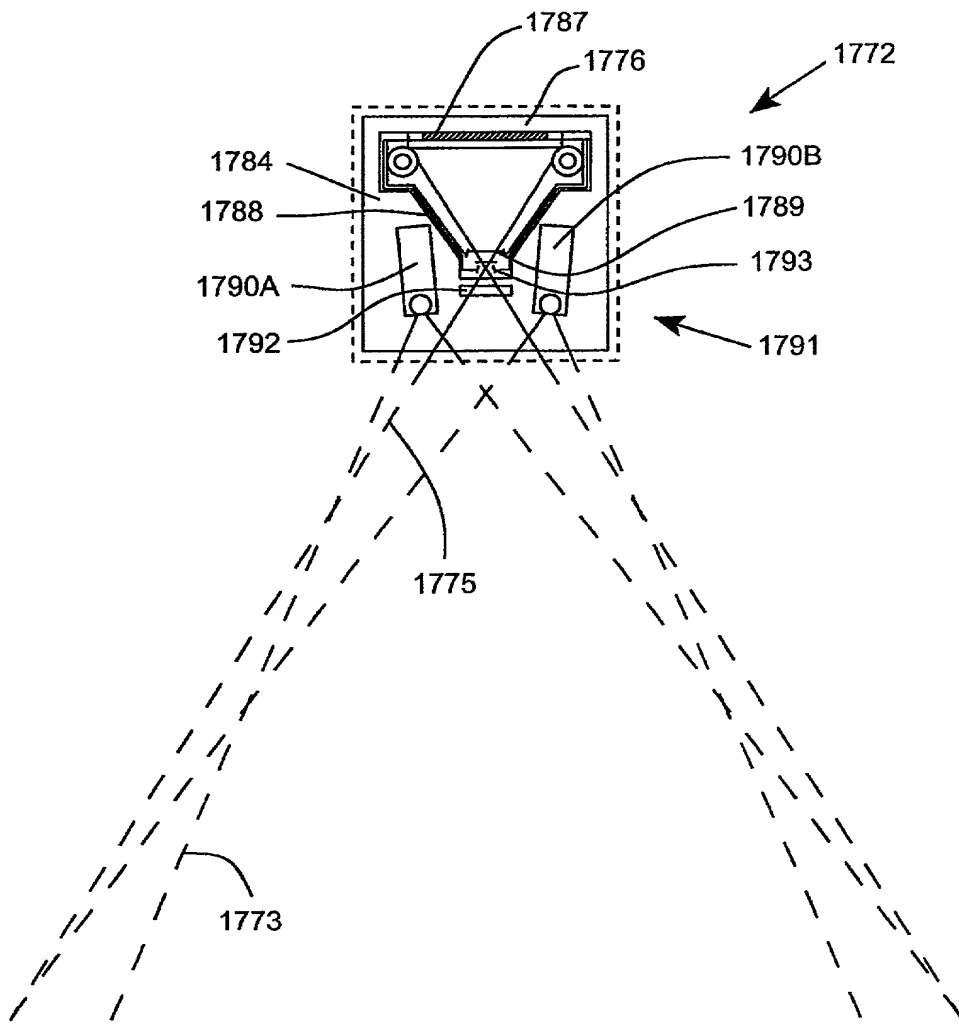


FIG. 50C

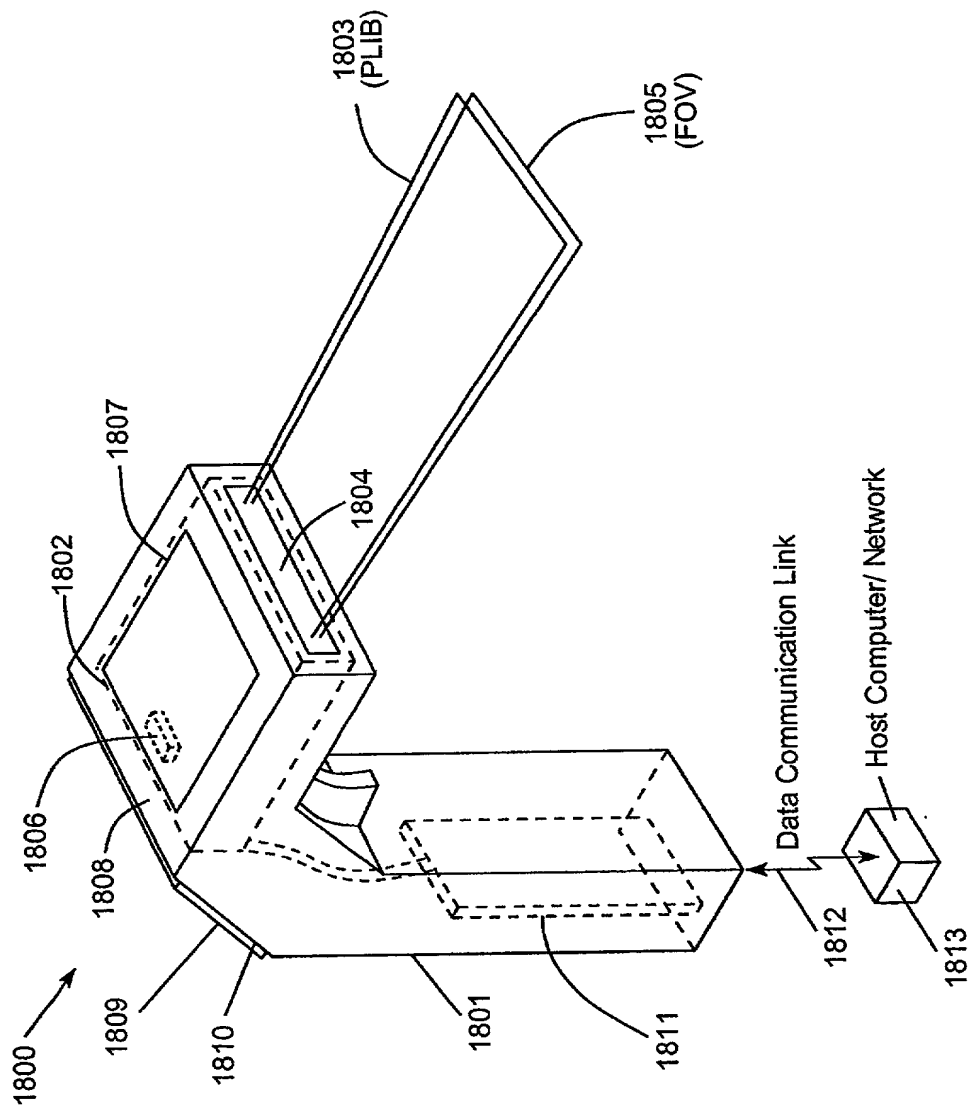


FIG. 51A

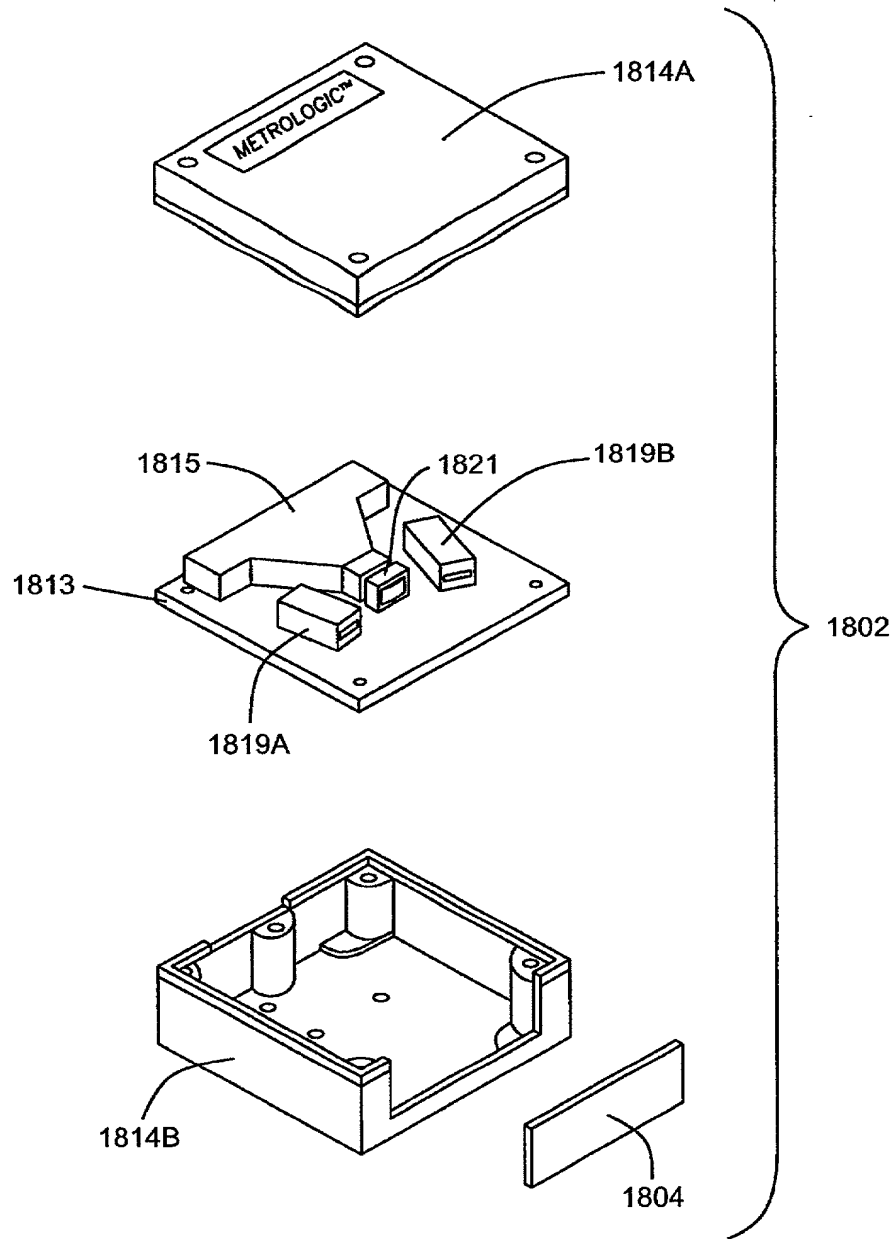


FIG. 51B

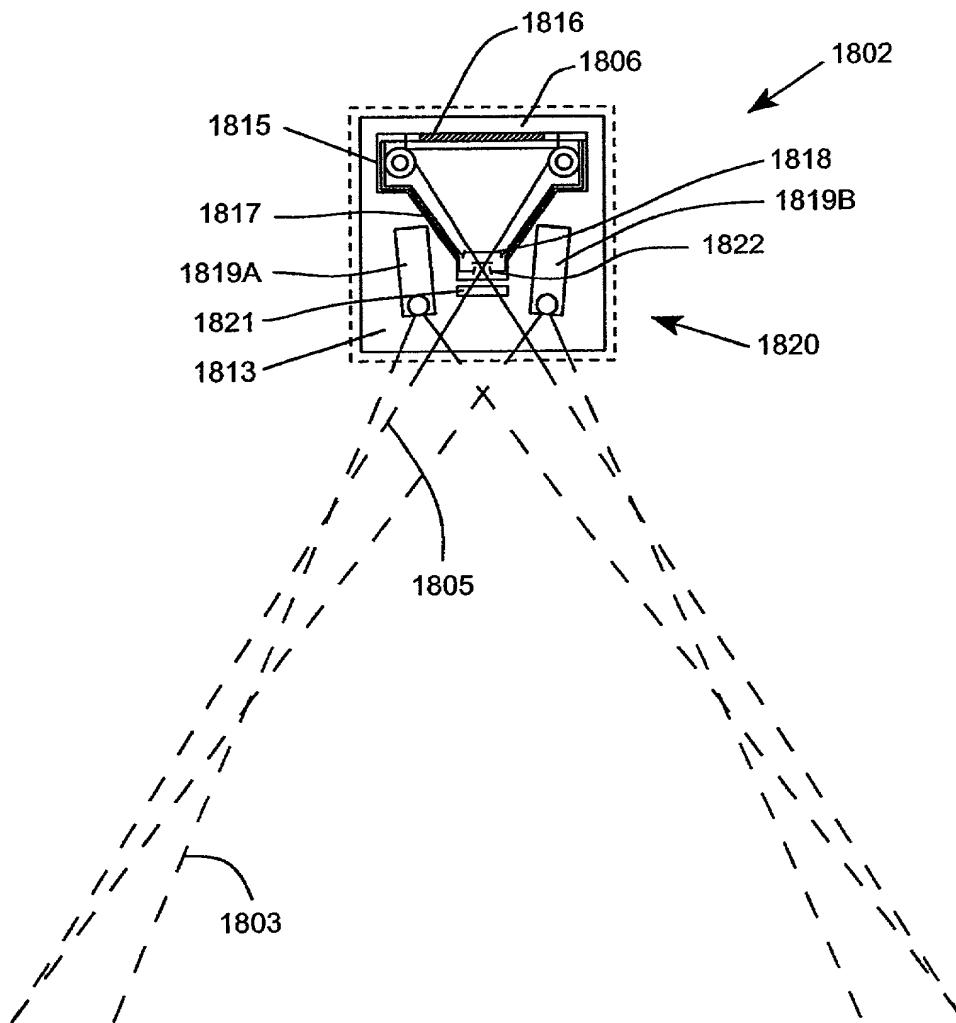


FIG. 51C



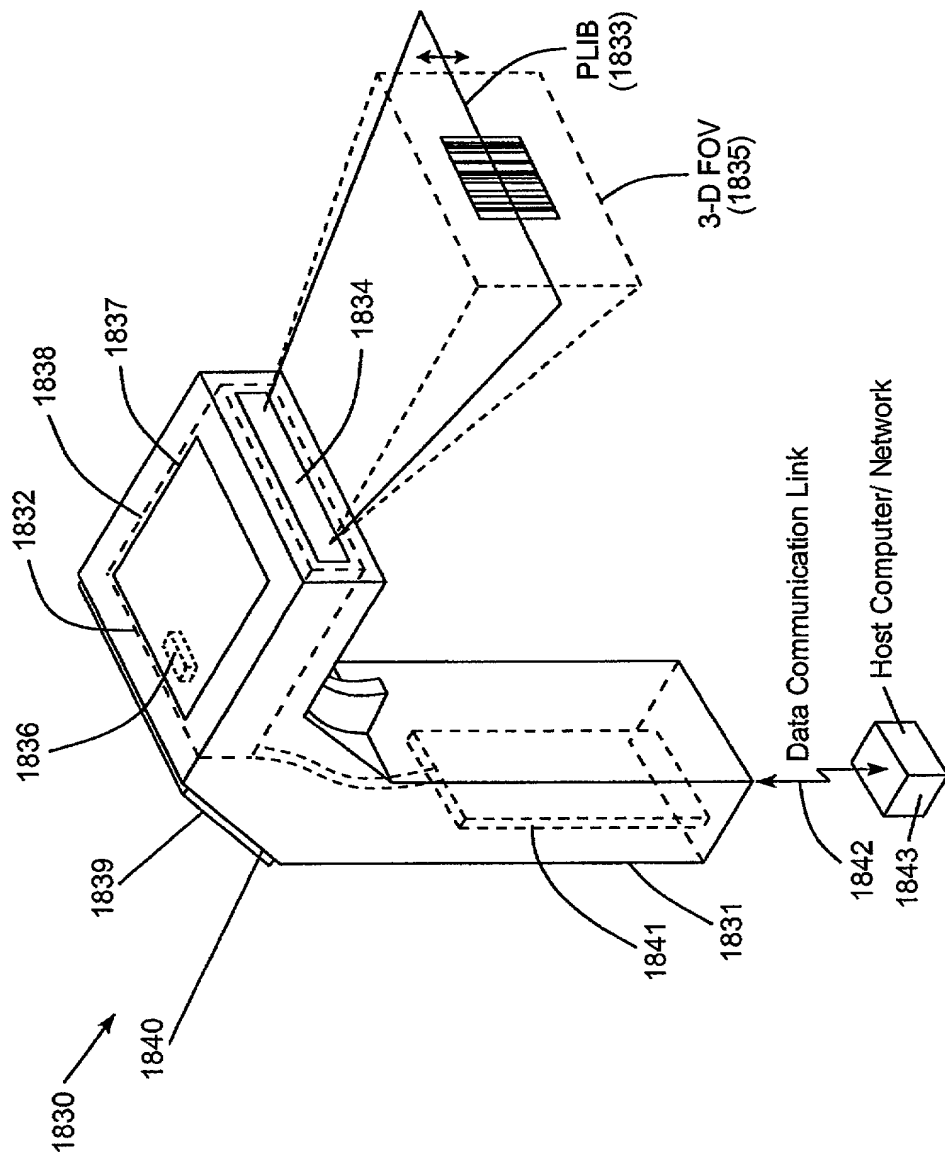


FIG. 52A

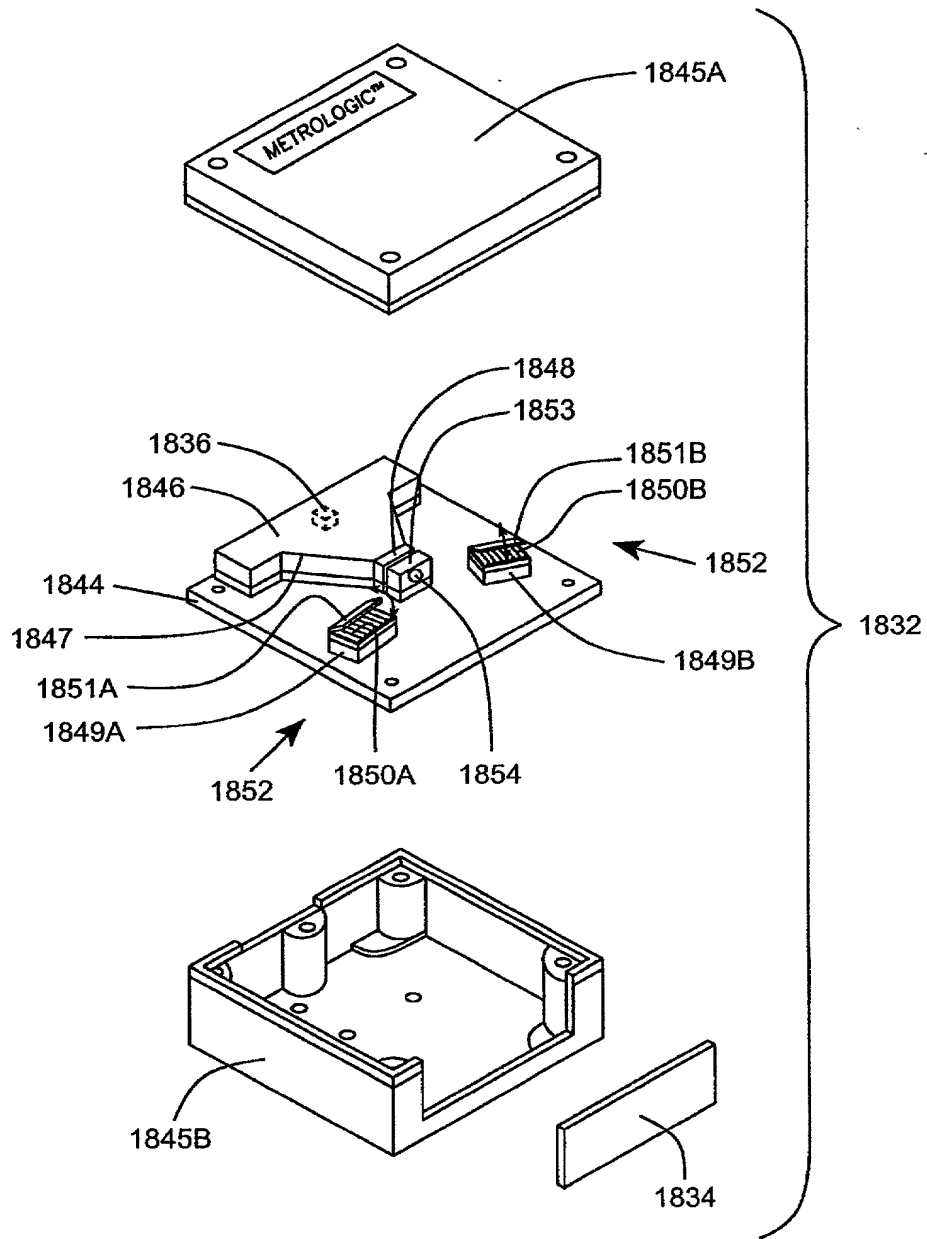


Fig. 113A-3B

FIG. 52B

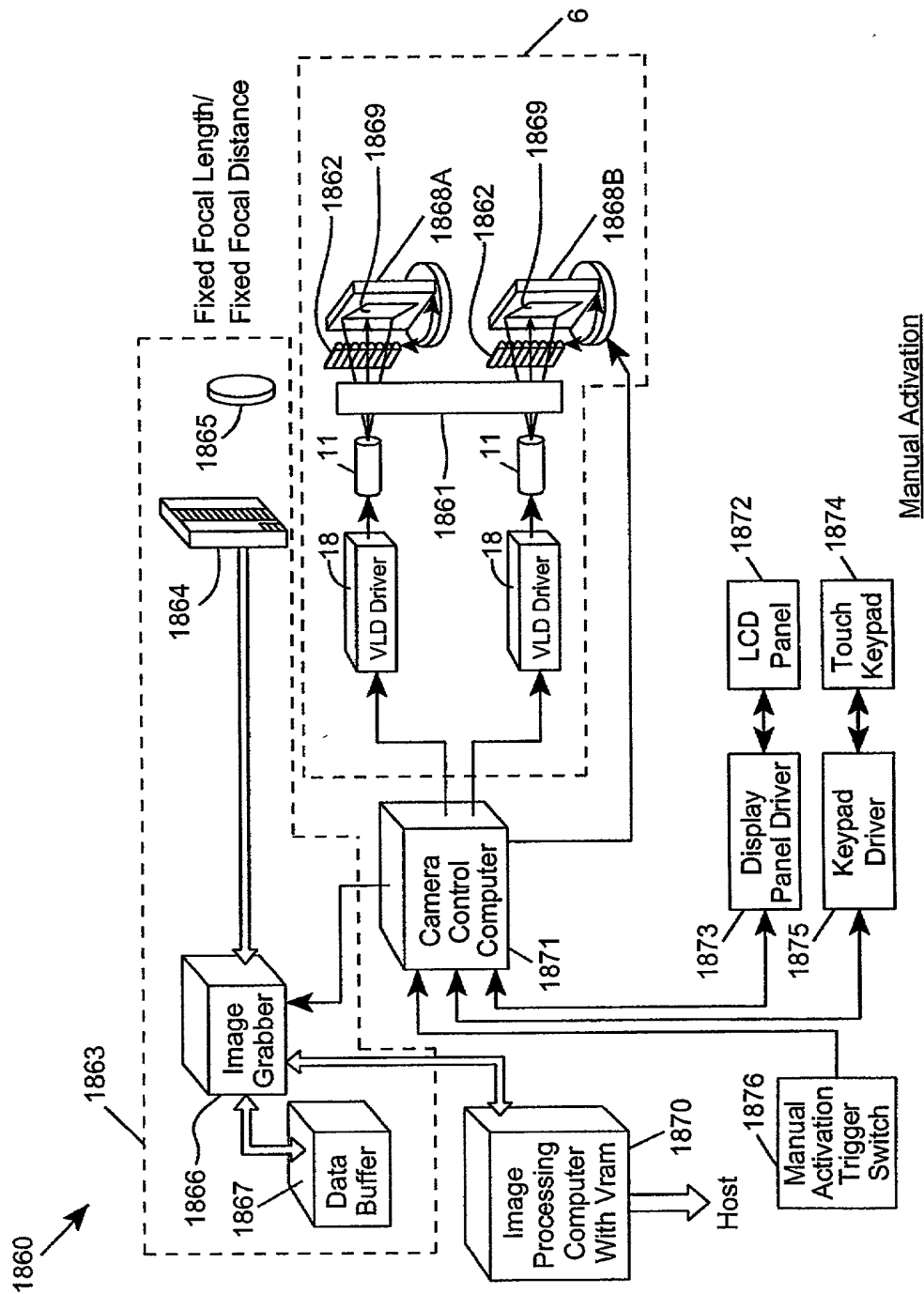


FIG. 53A1

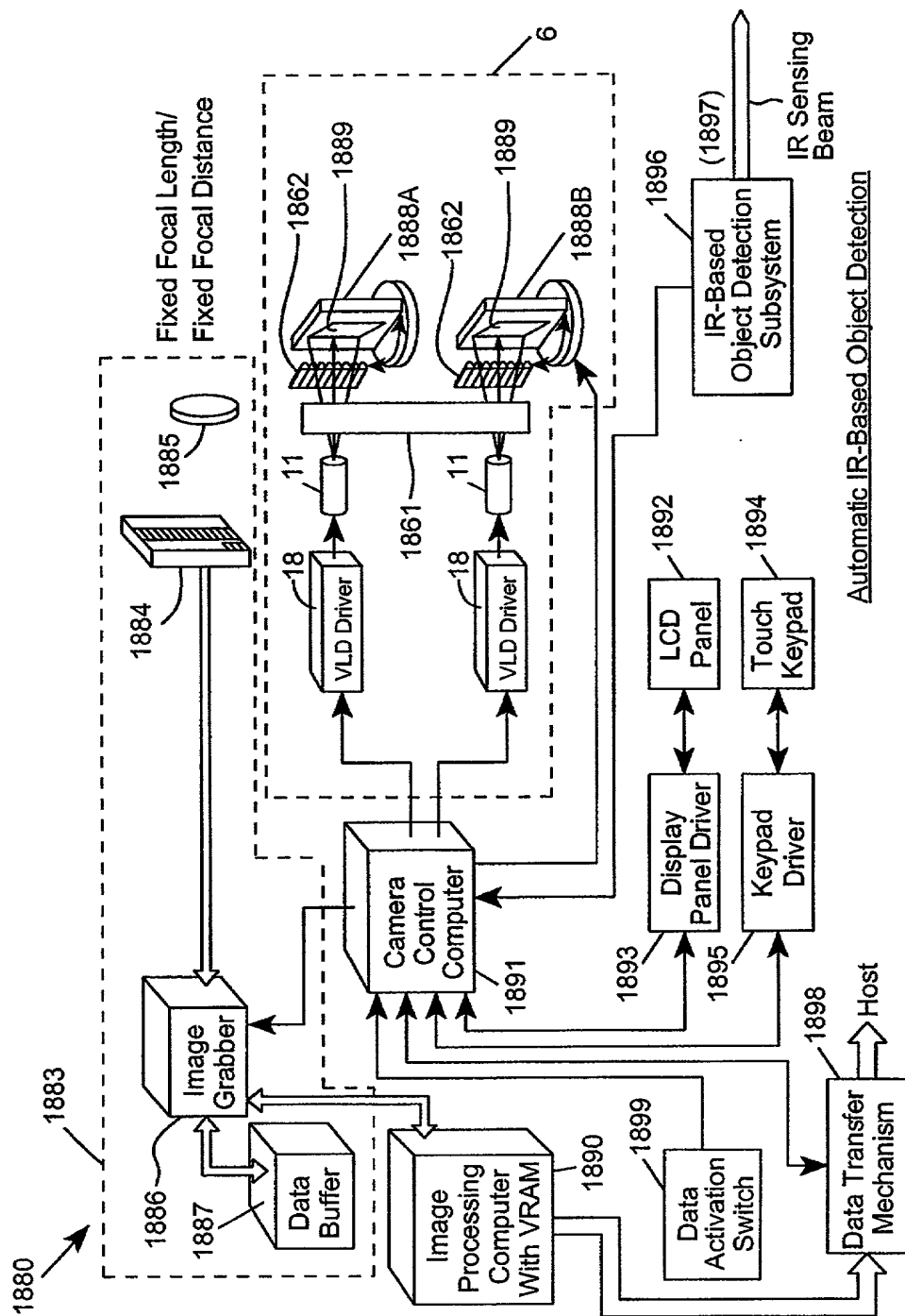


FIG. 53A2



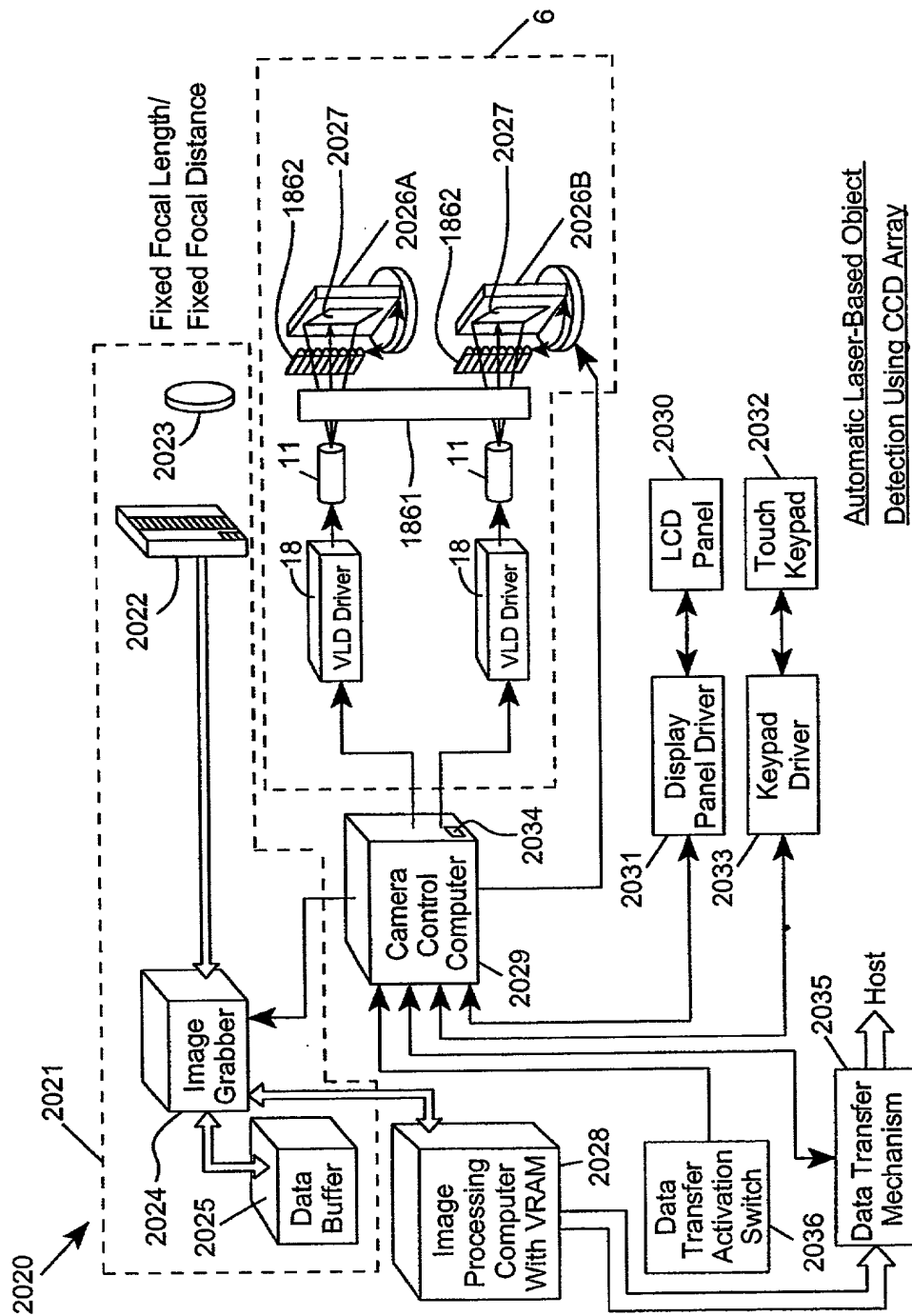


FIG. 53A4

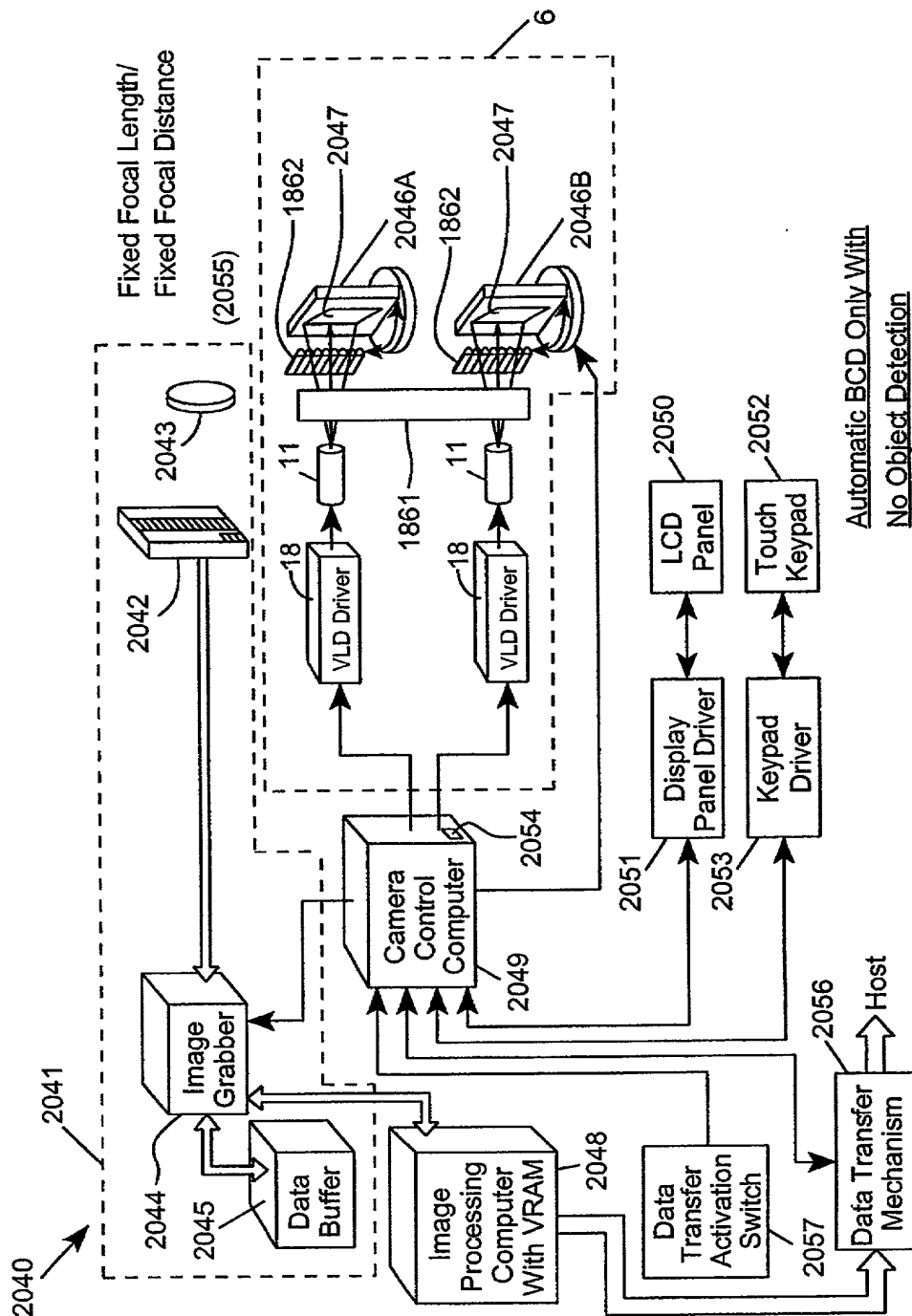
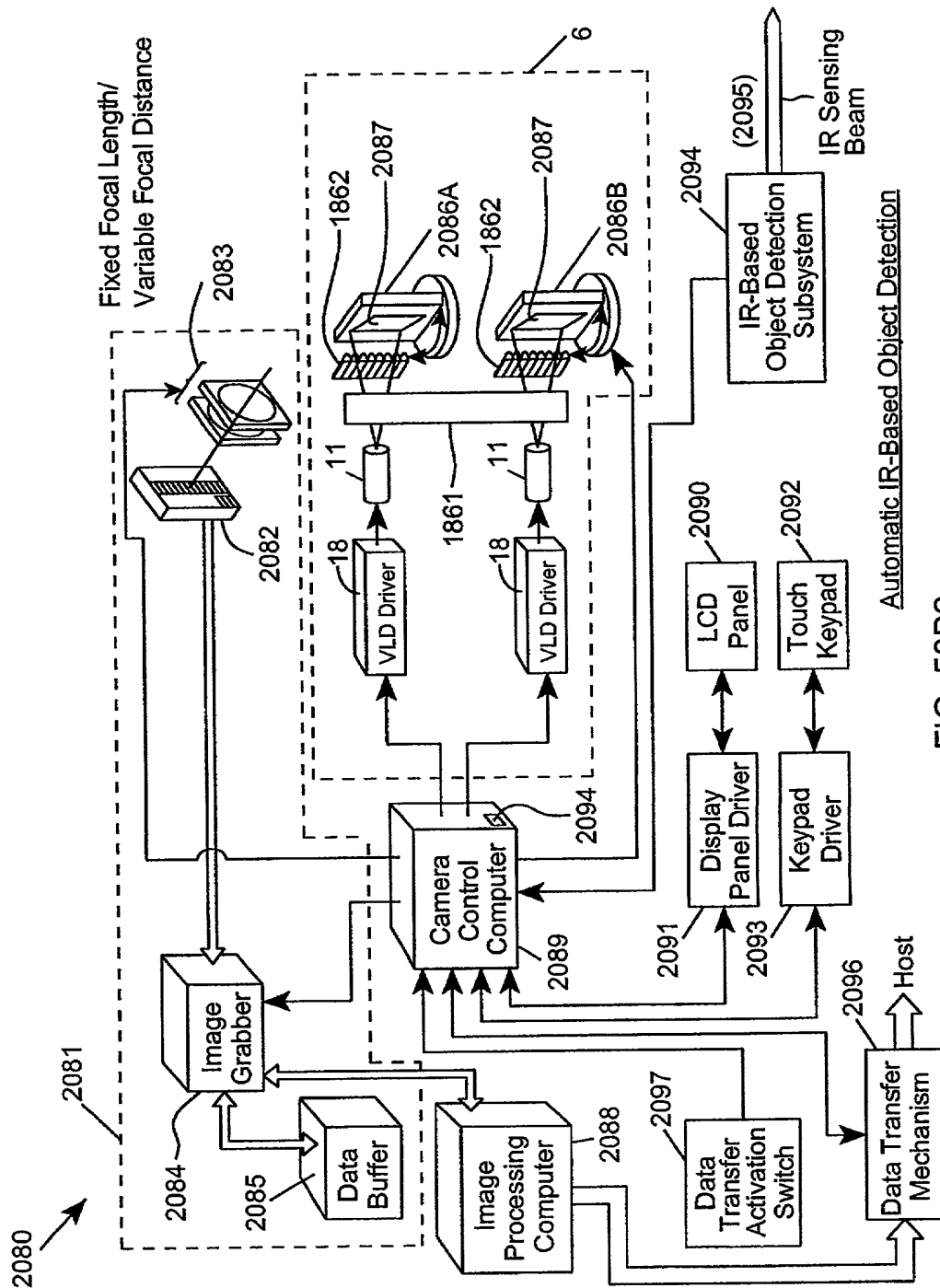
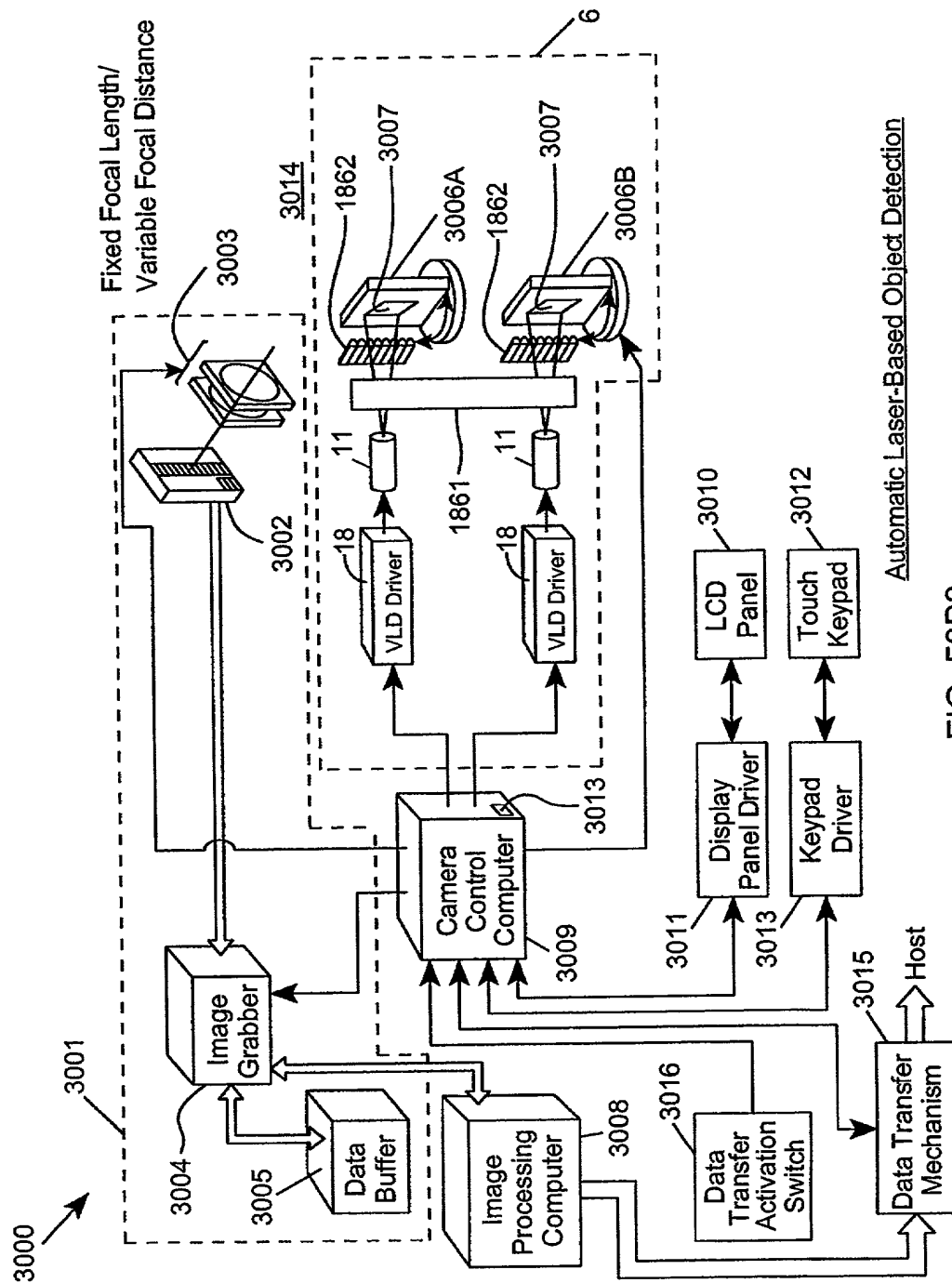


FIG. 53A5









Automatic Laser-Based Object Detection

FIG. 53B3

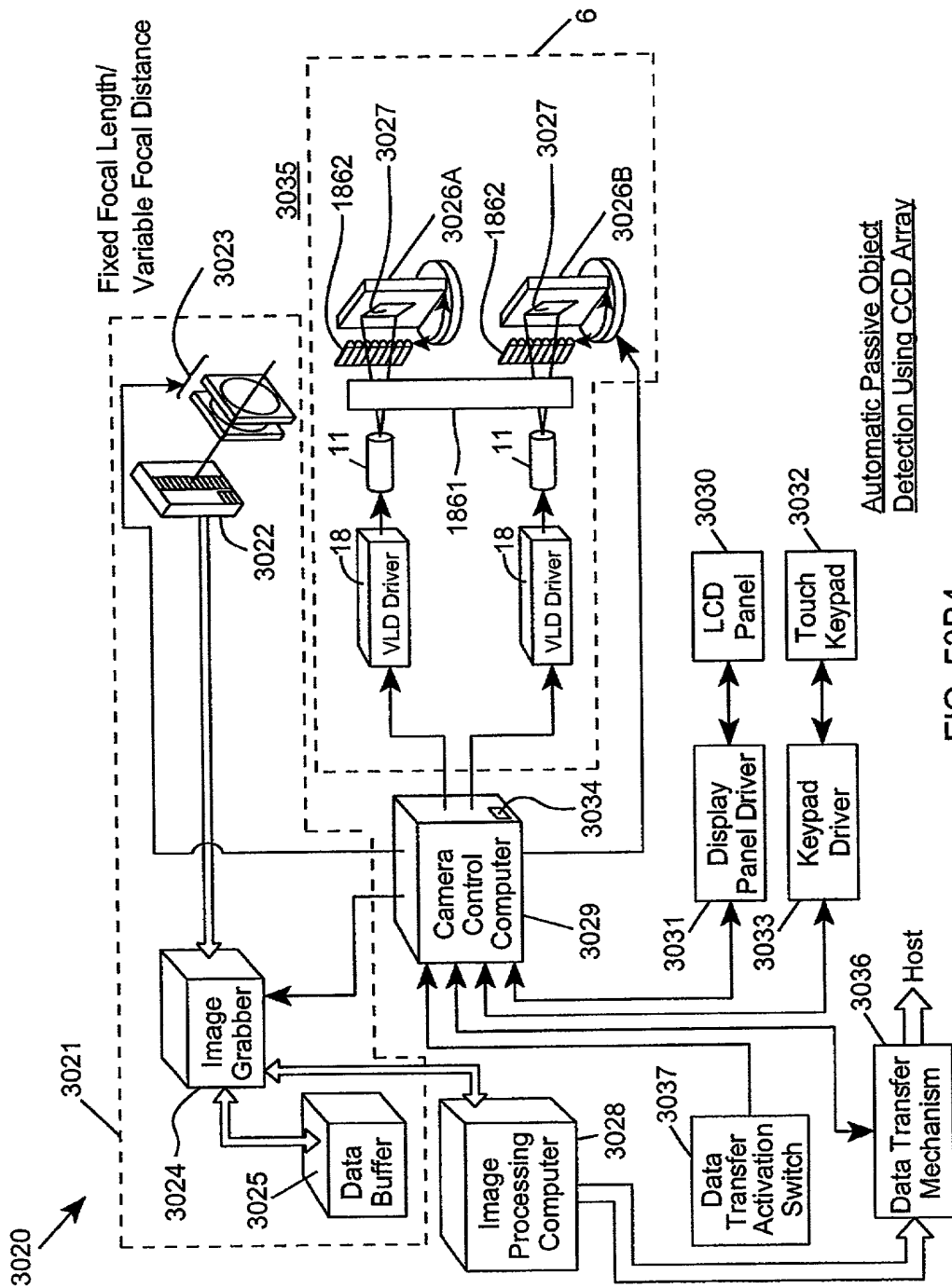
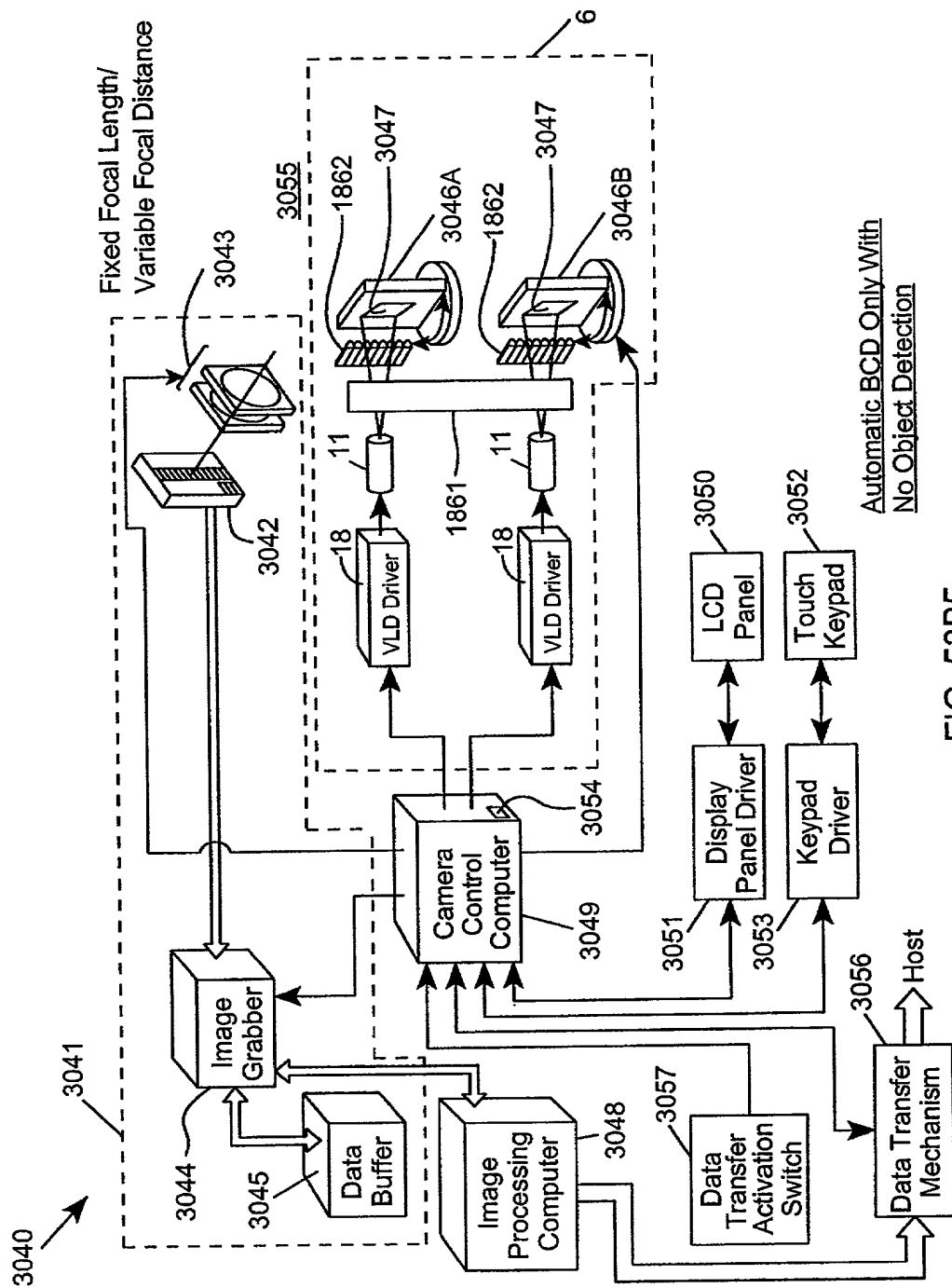


FIG. 53B4



Automatic BCD Only With  
No Object Detection

FIG. 53B5

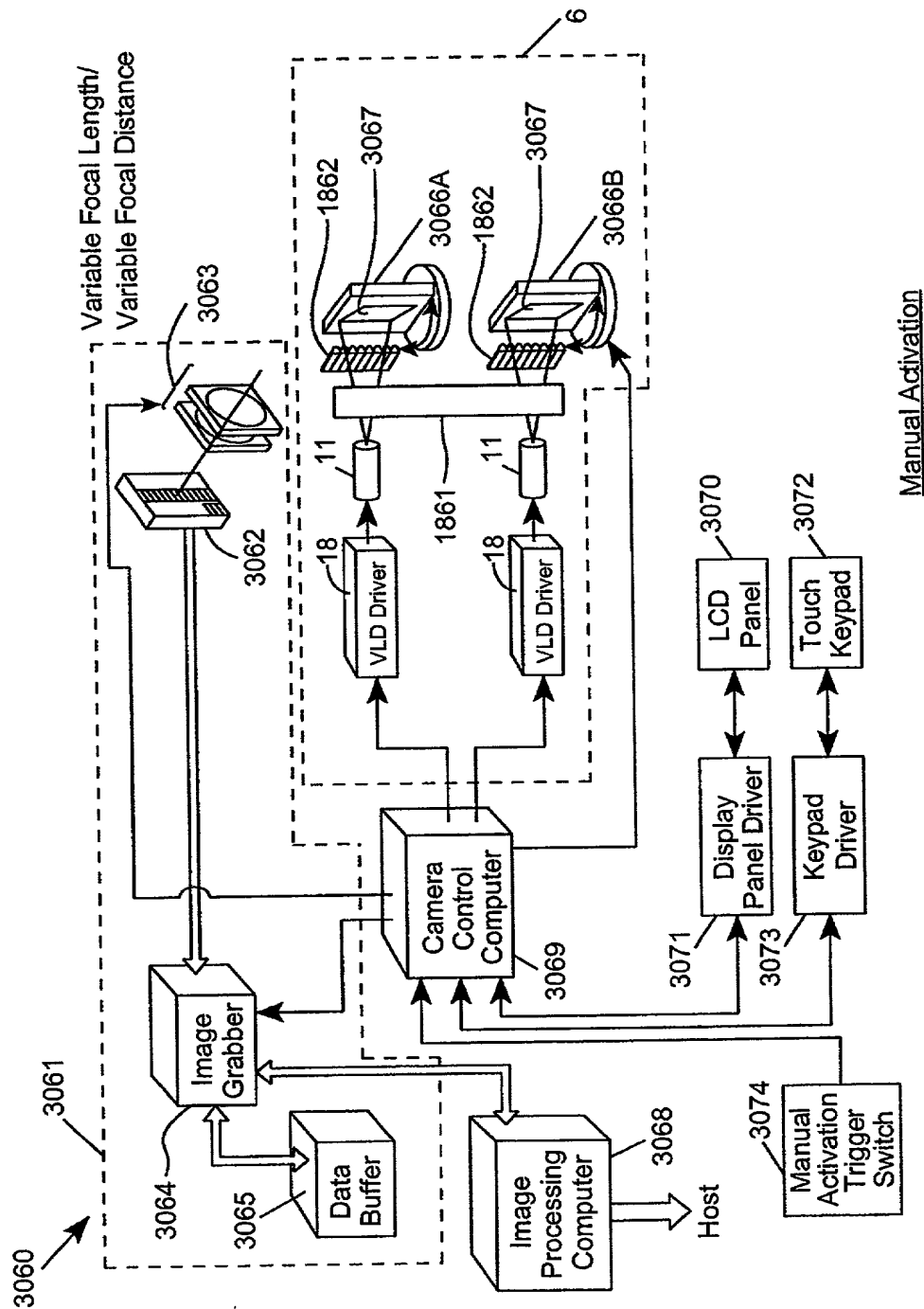


FIG. 53C1

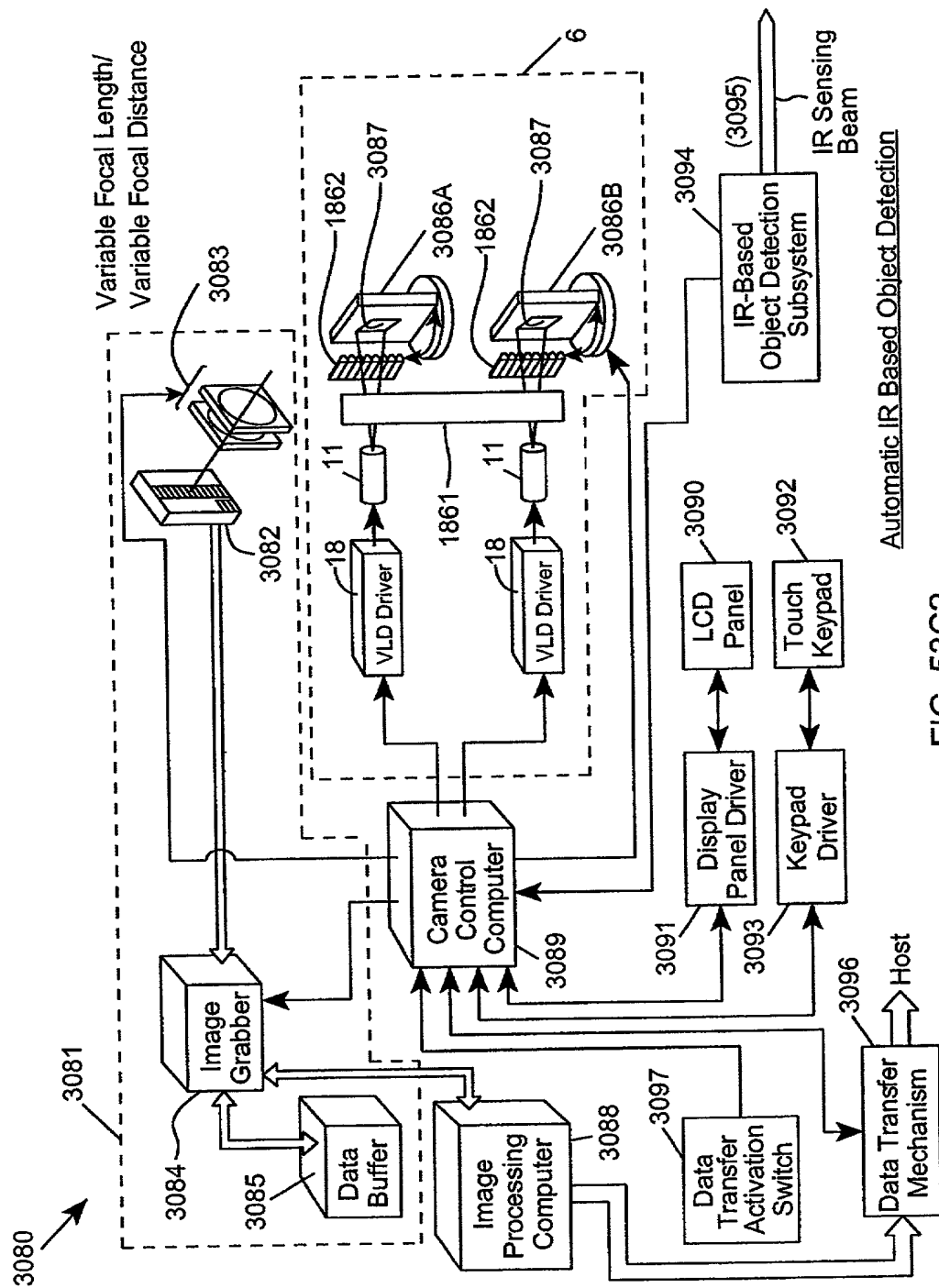
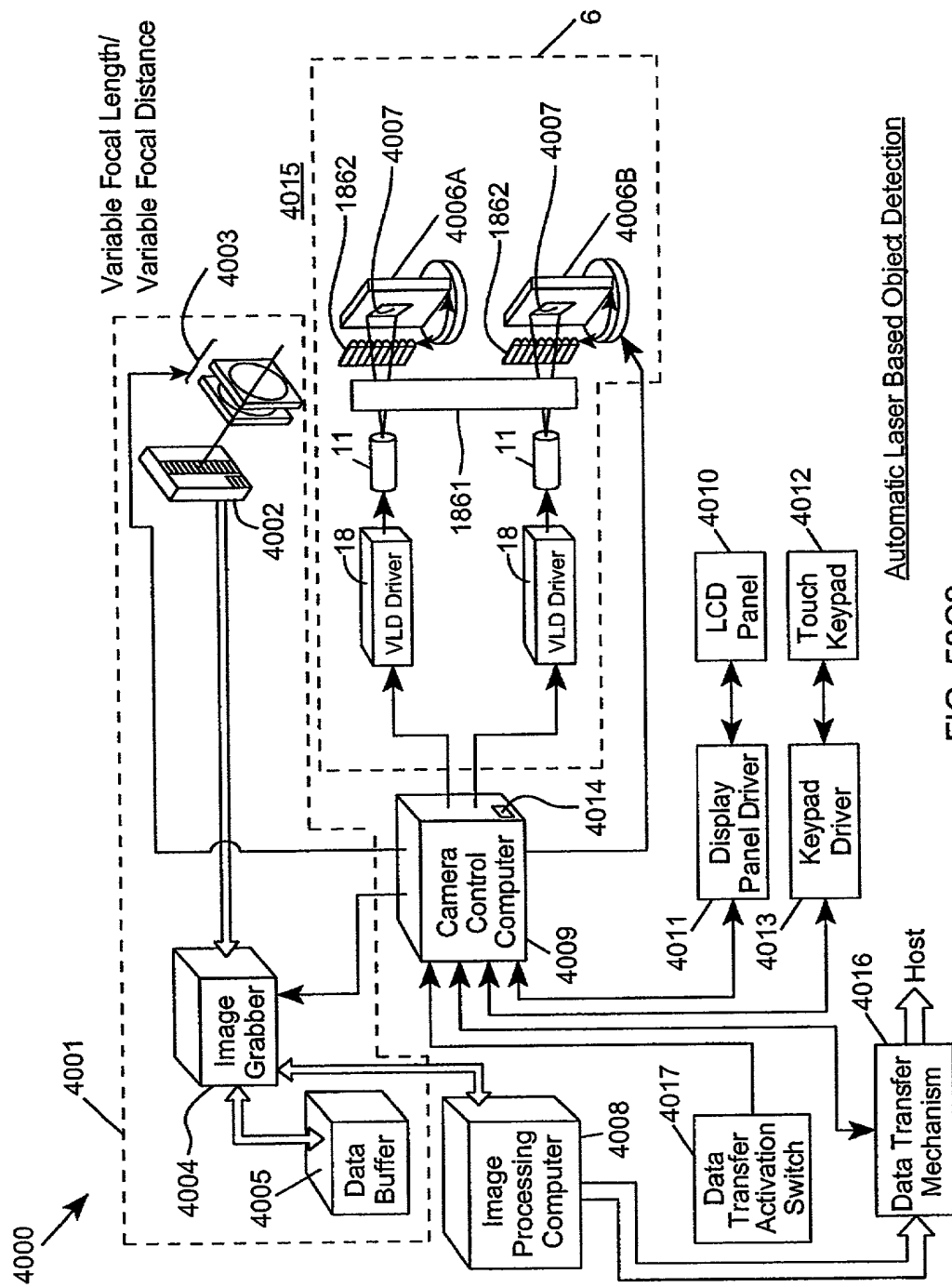


FIG. 53C2



**FIG. 53C3**

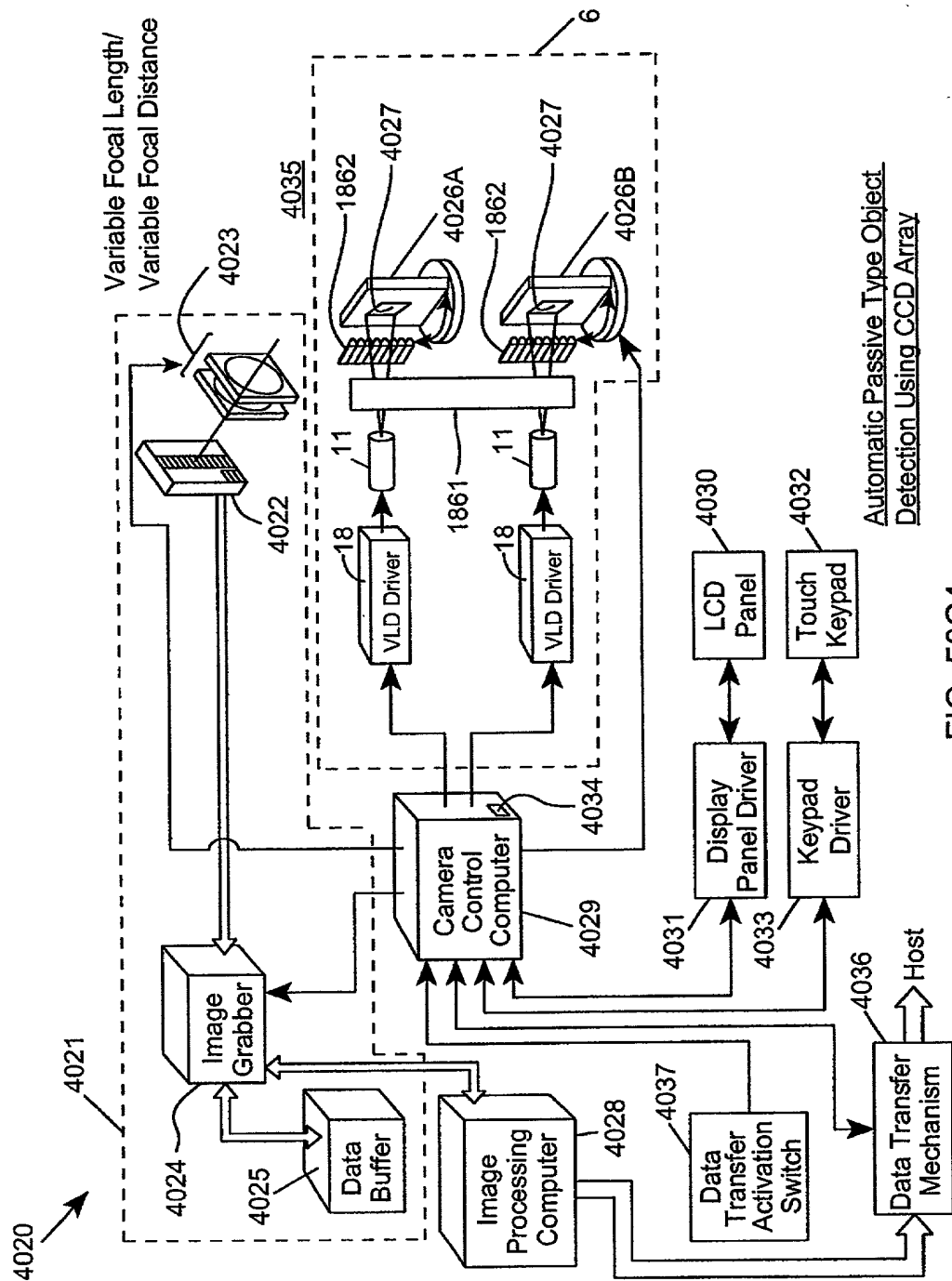


FIG. 53C4





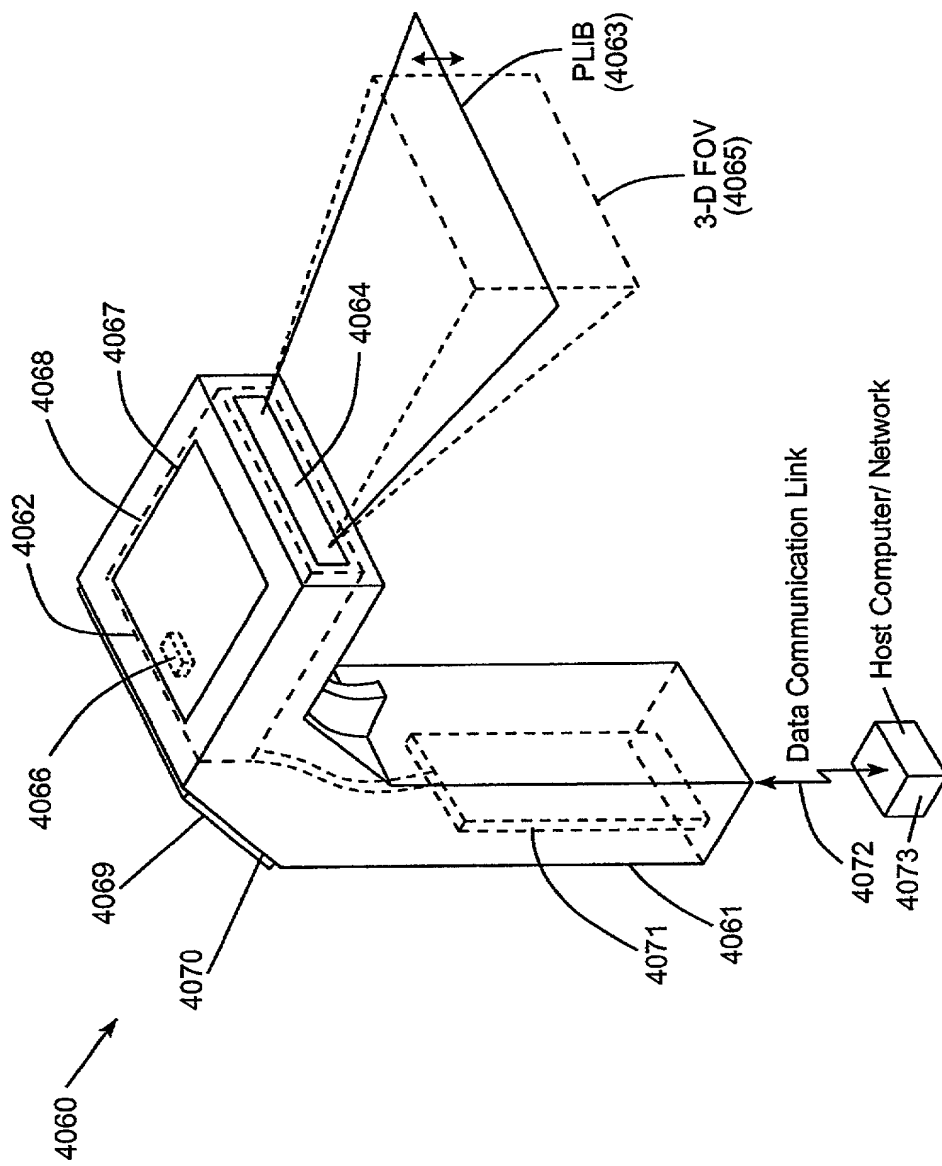
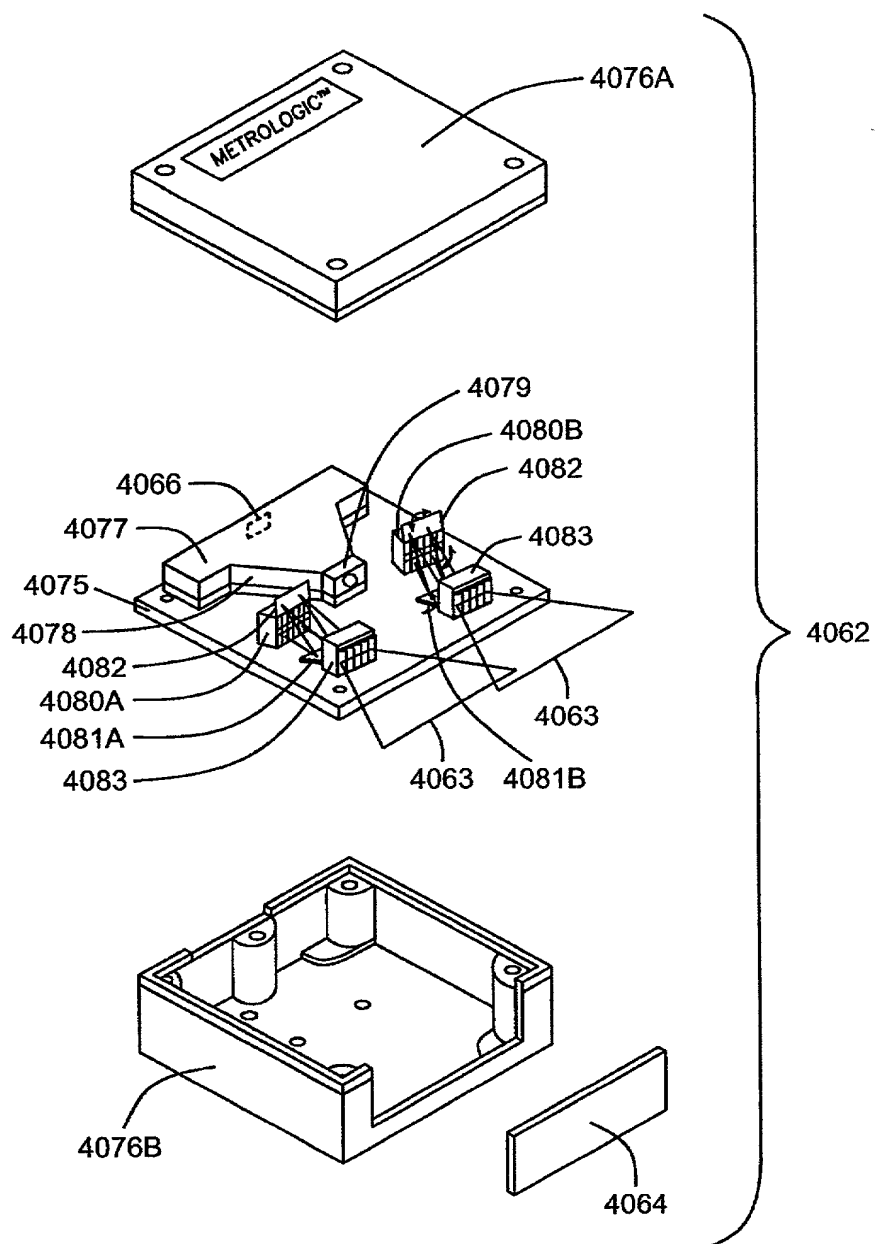


FIG. 54A



(Dual Mirrors)  
Fig. 115A-5D

FIG. 54B

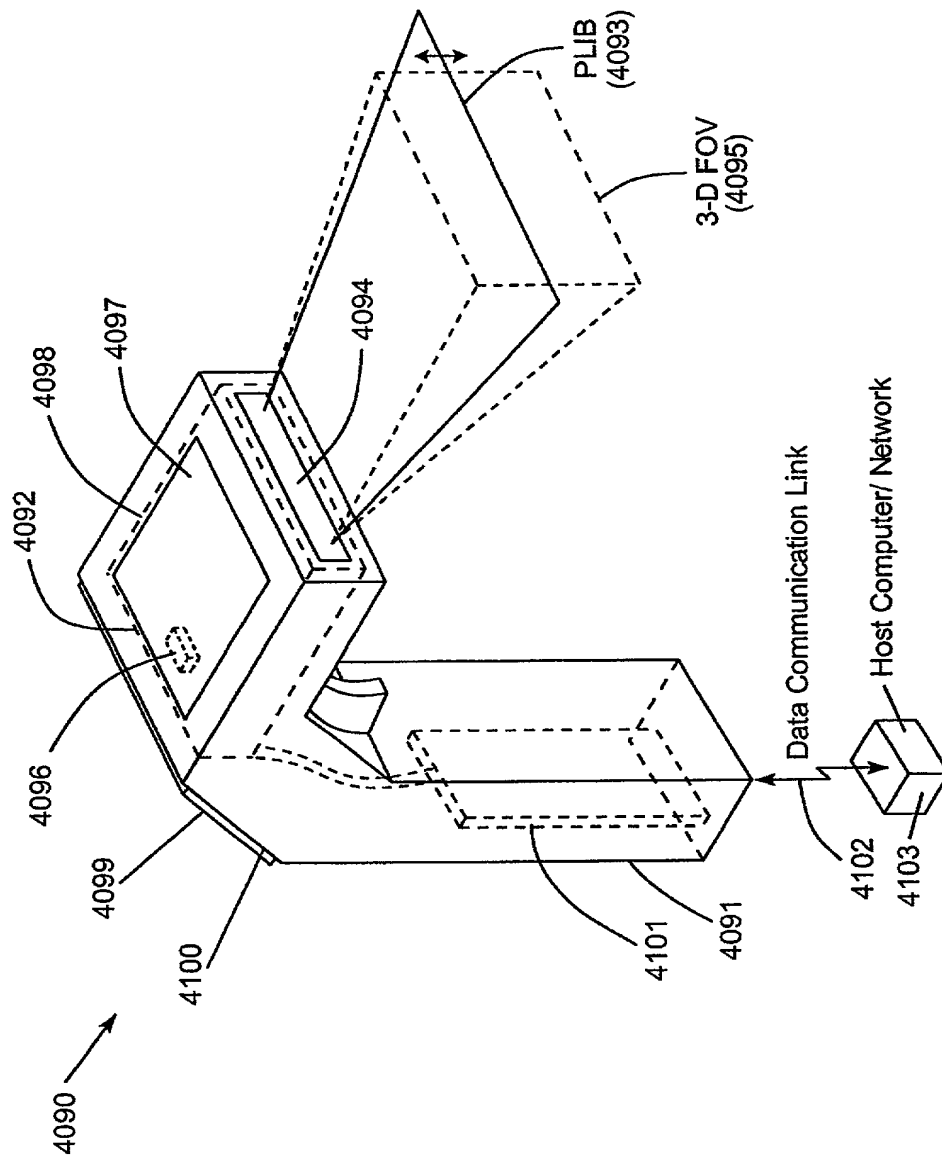


FIG. 55A



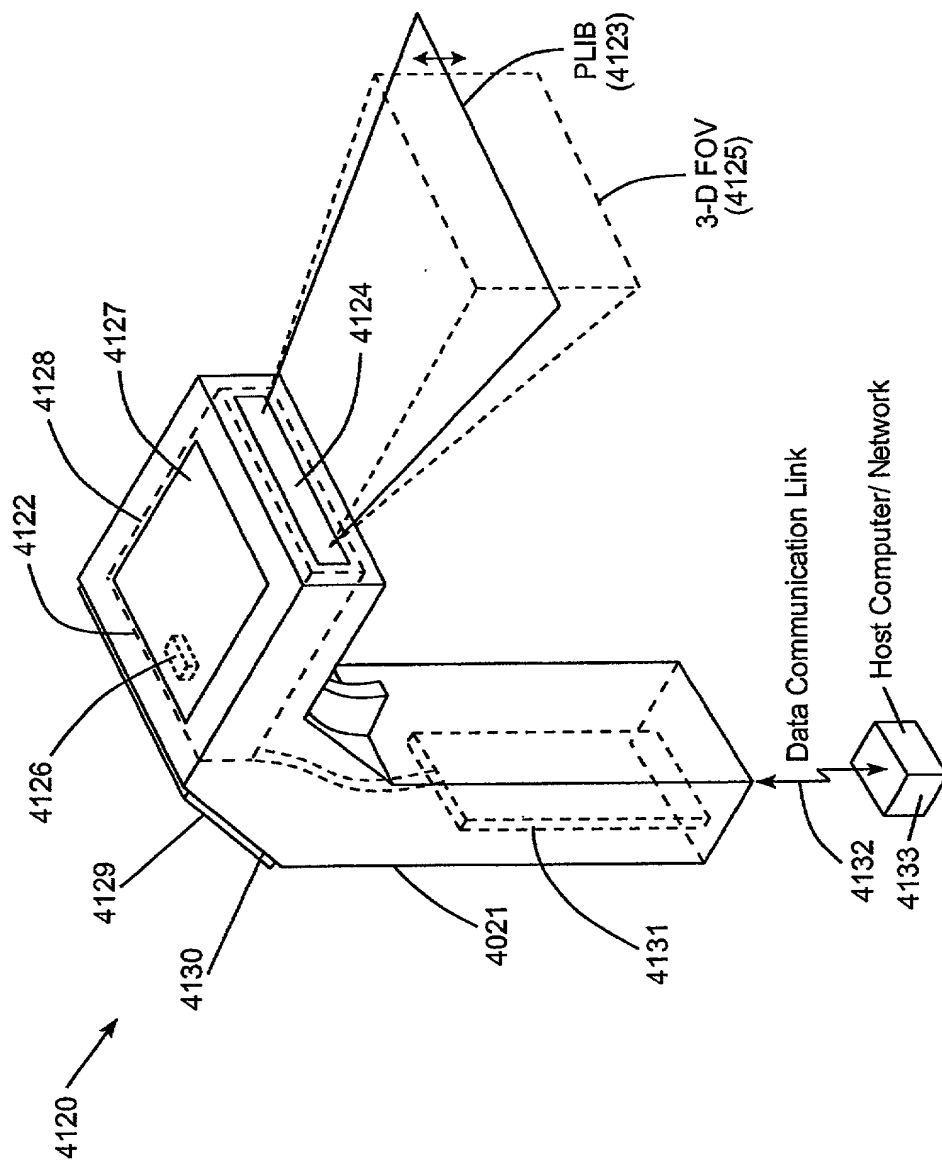
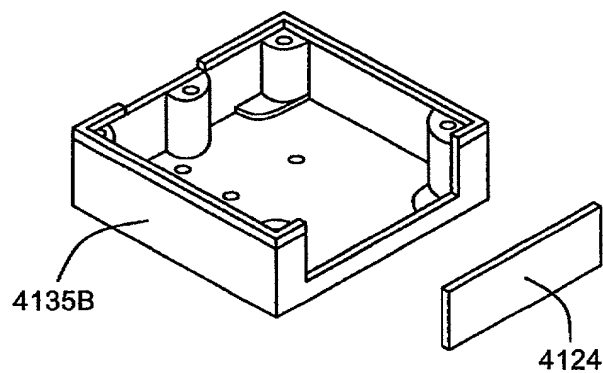
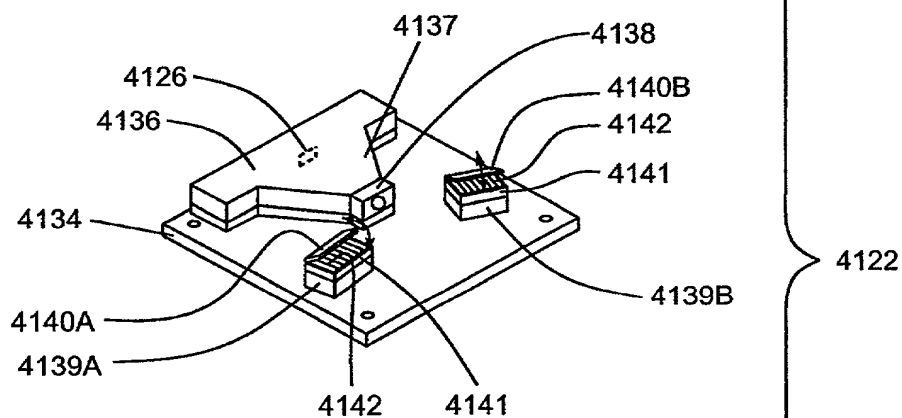
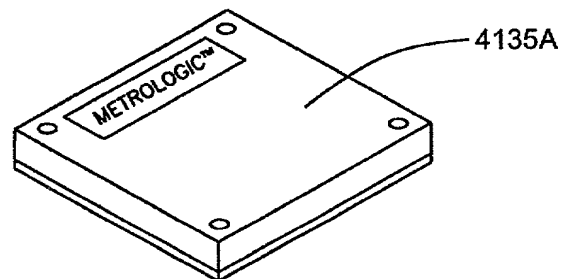


FIG. 56A



DM  
Fig. 117A-7B

FIG. 56B

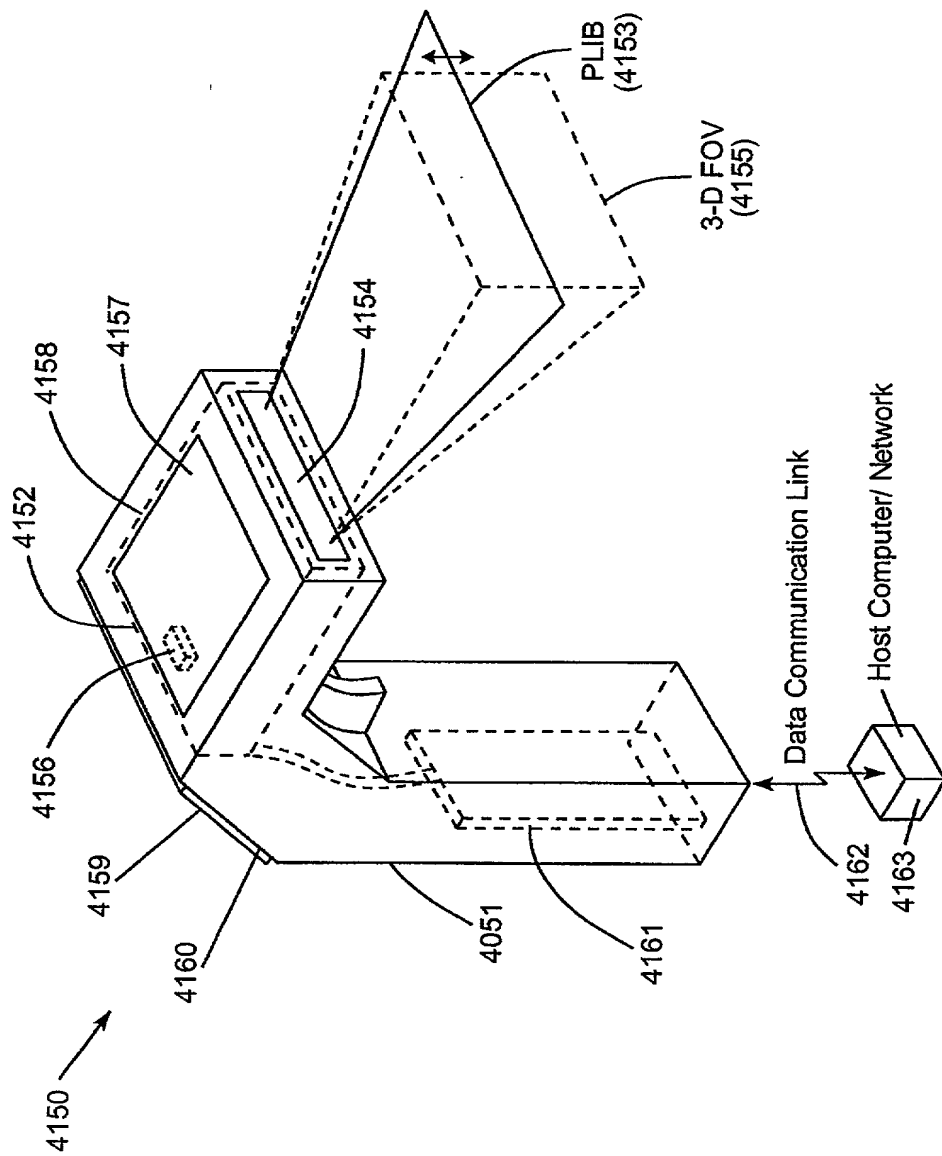
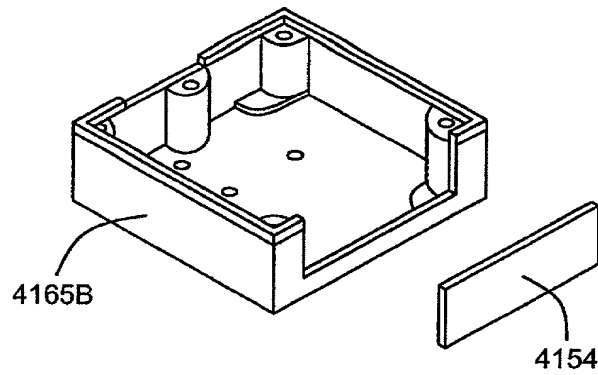
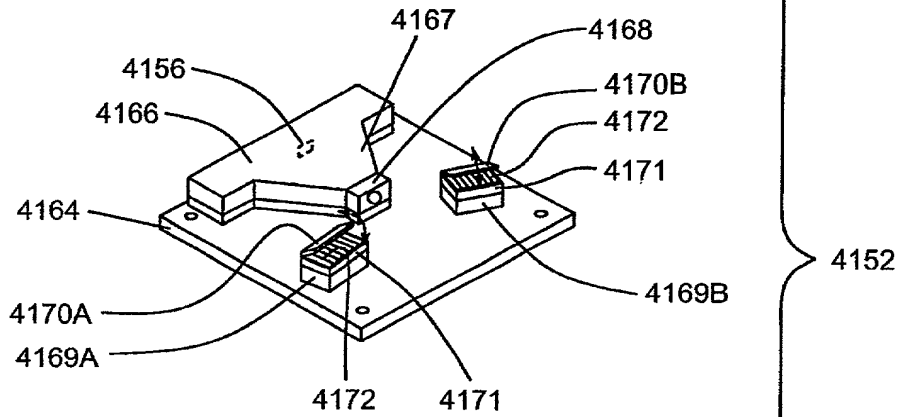
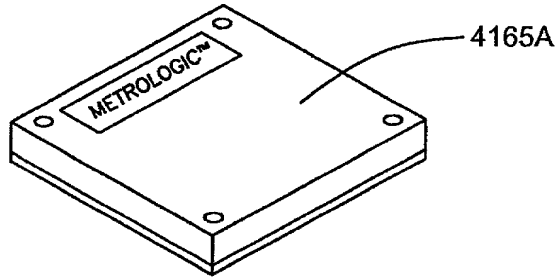


FIG. 57A





Phase Only LCD  
PM Panel  
Fig. 118F-8G

FIG. 57B

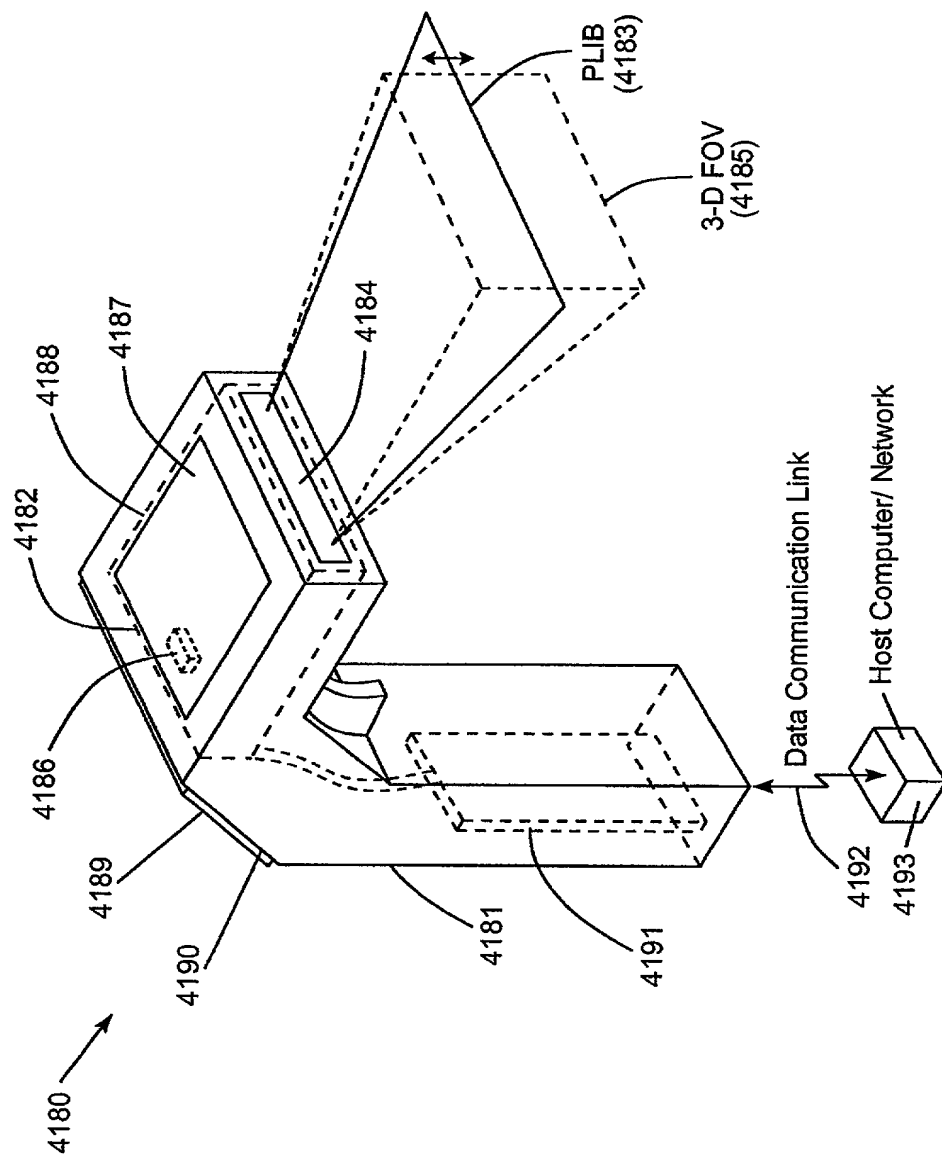
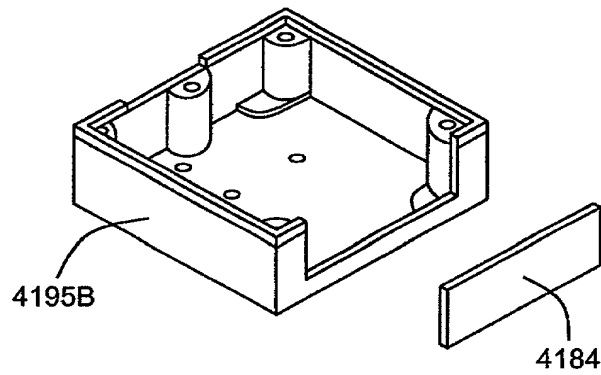
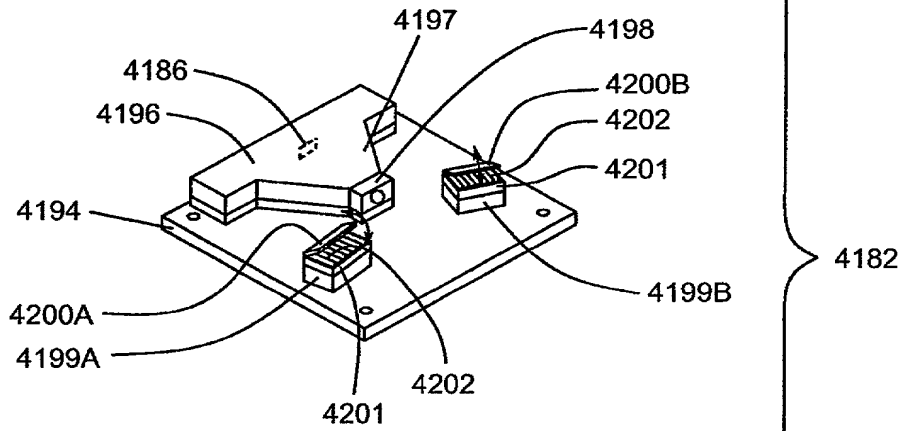
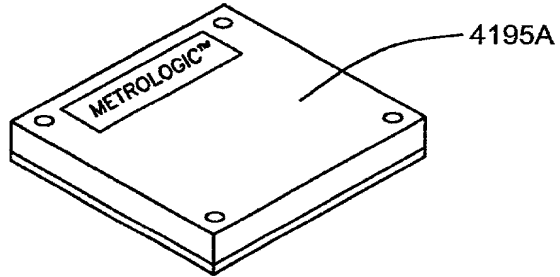
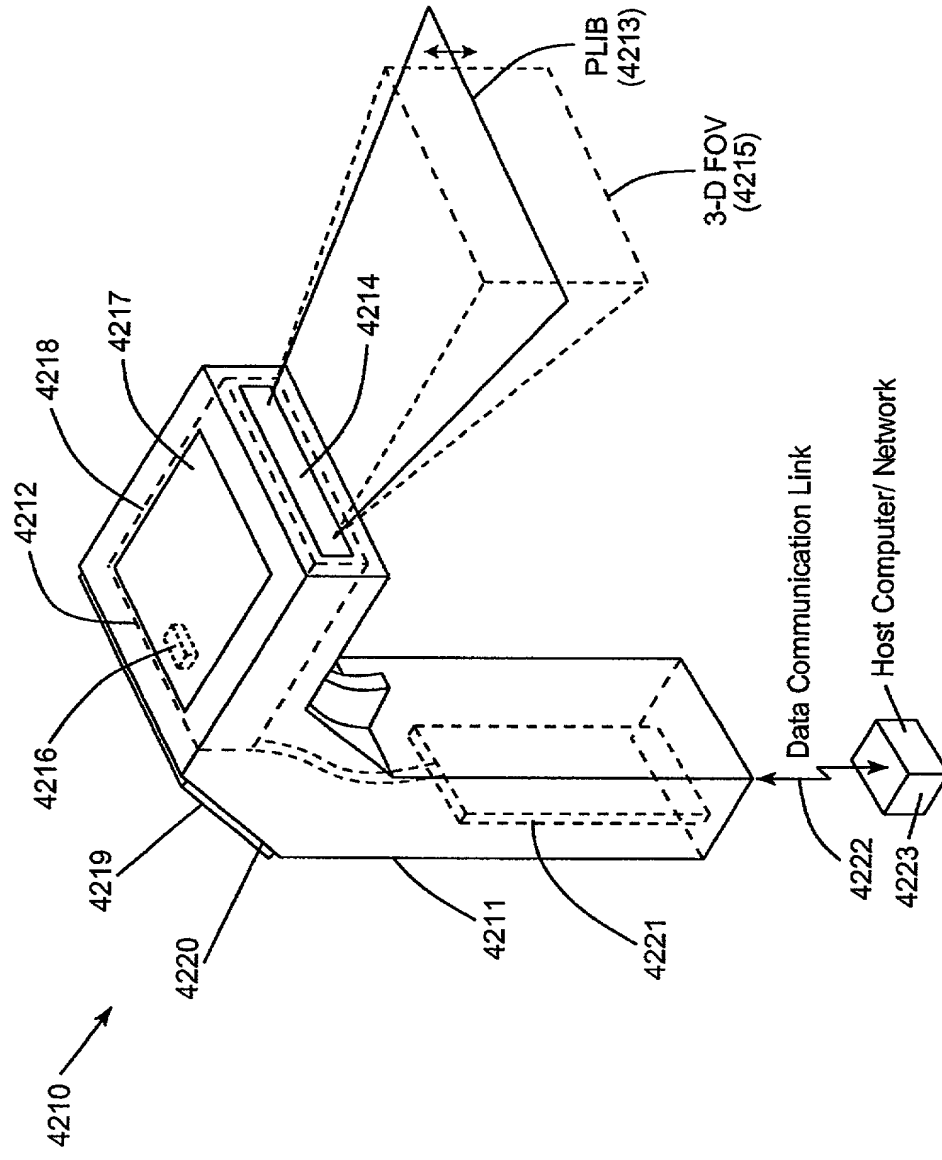


FIG. 58A

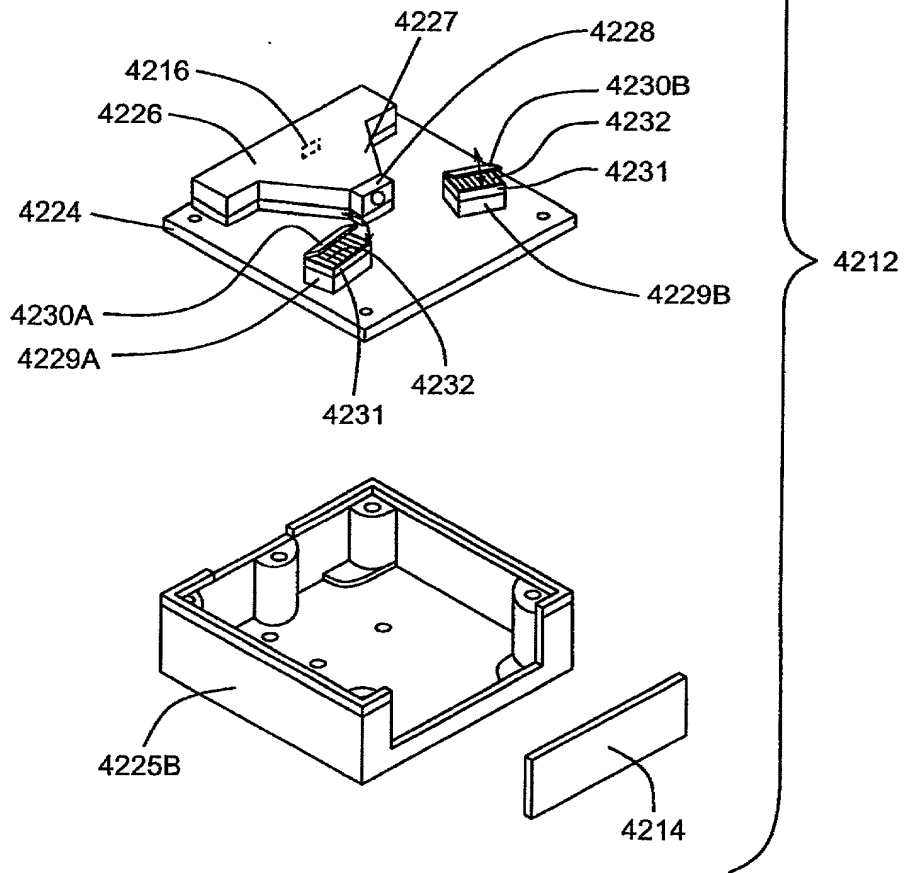
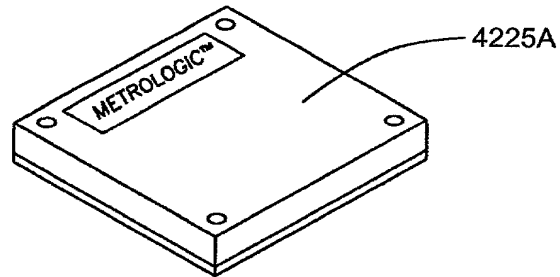


HS Optical Shutter  
Fig. 1114A-14B

FIG. 58B



**FIG. 59A**

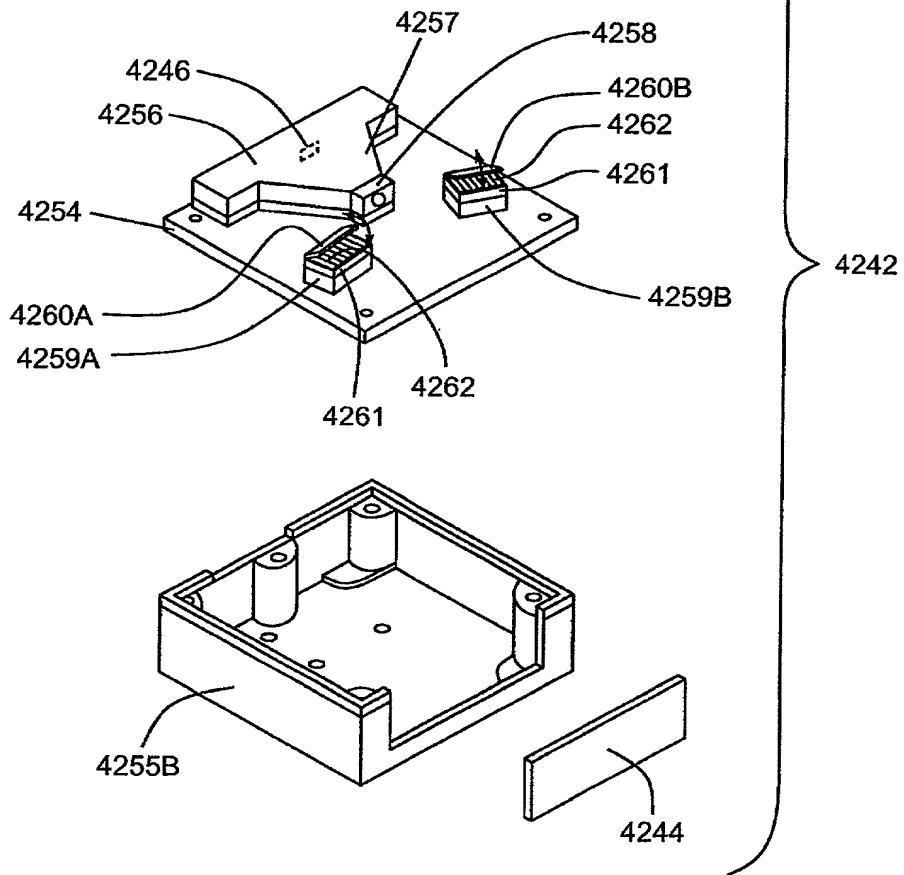
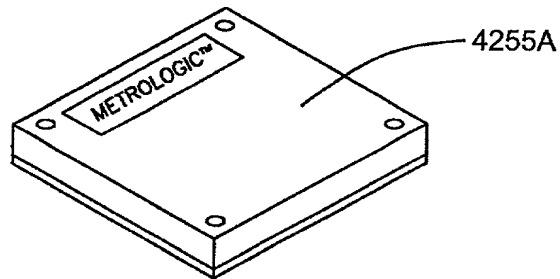


MLLD

Fig. 1115A-15B

FIG. 59B





Etalon (Temp. Phase Mod.)

Fig. 1117A-17B

FIG. 60B

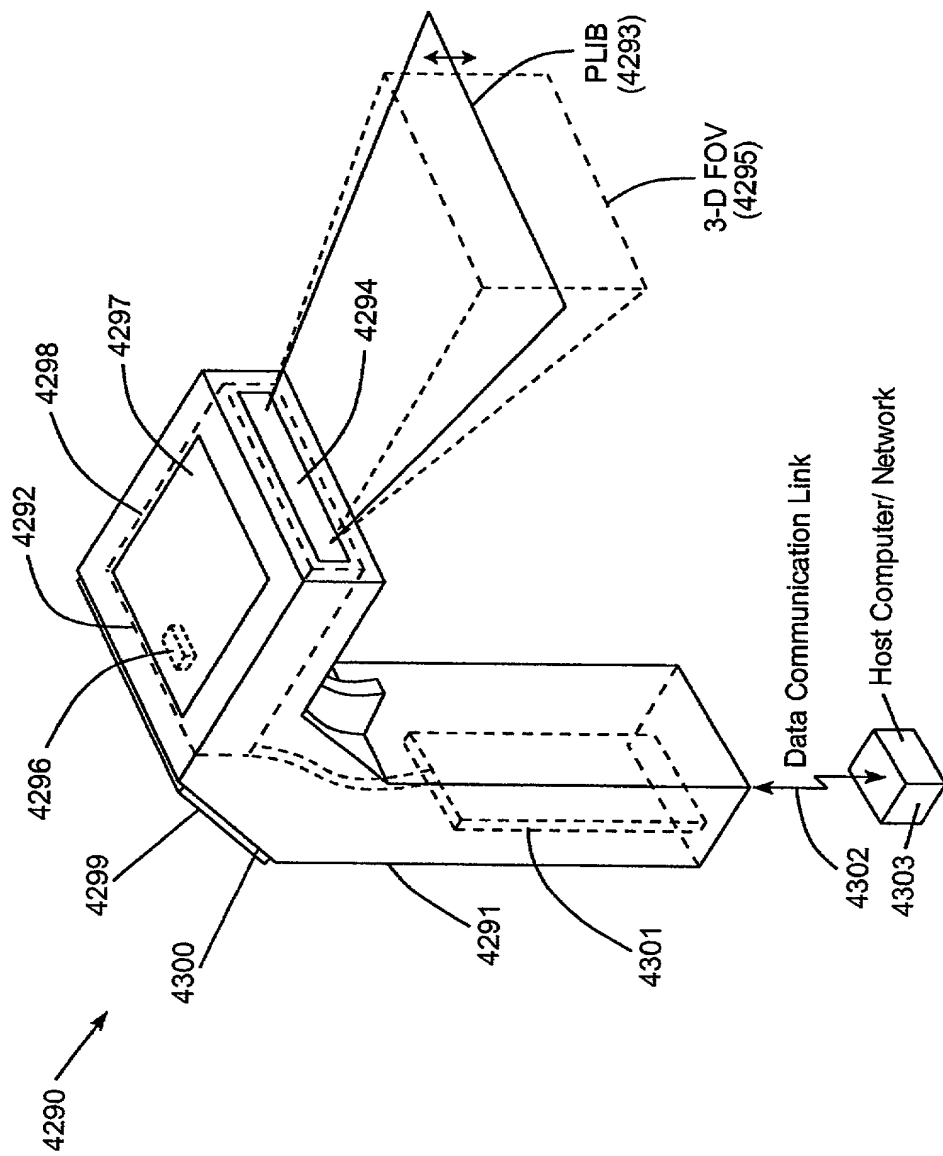
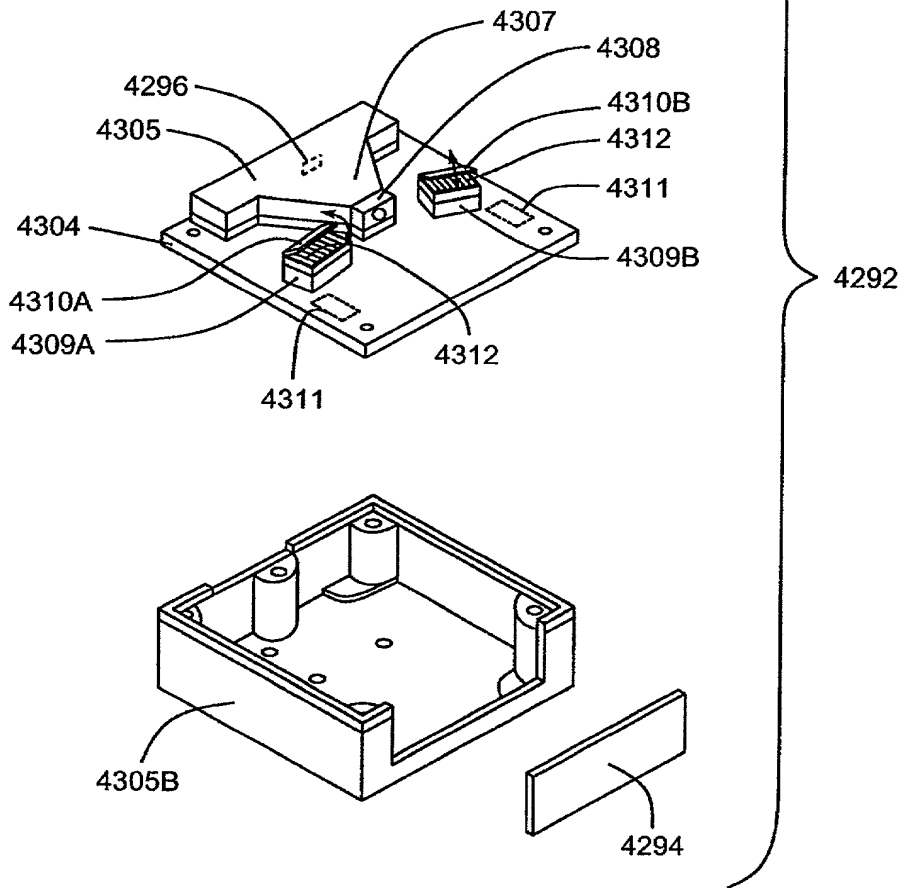
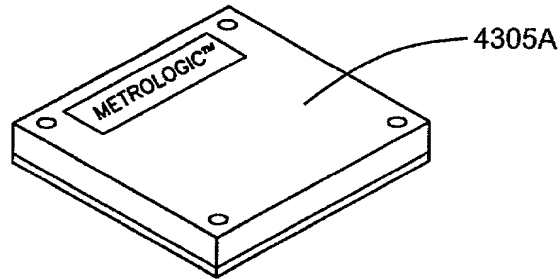


FIG. 61A





Mode Hopping  
Fig. 1119A-19B

FIG. 61B

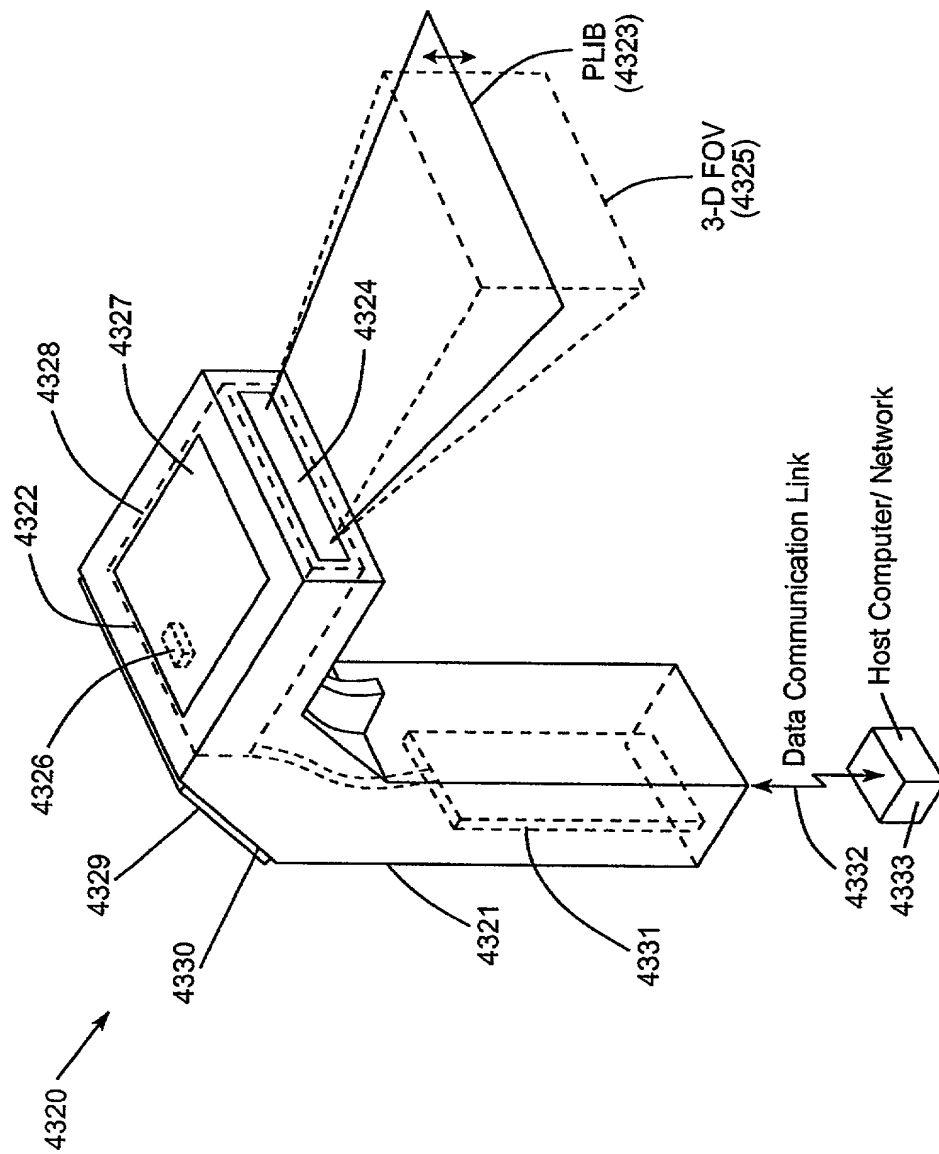
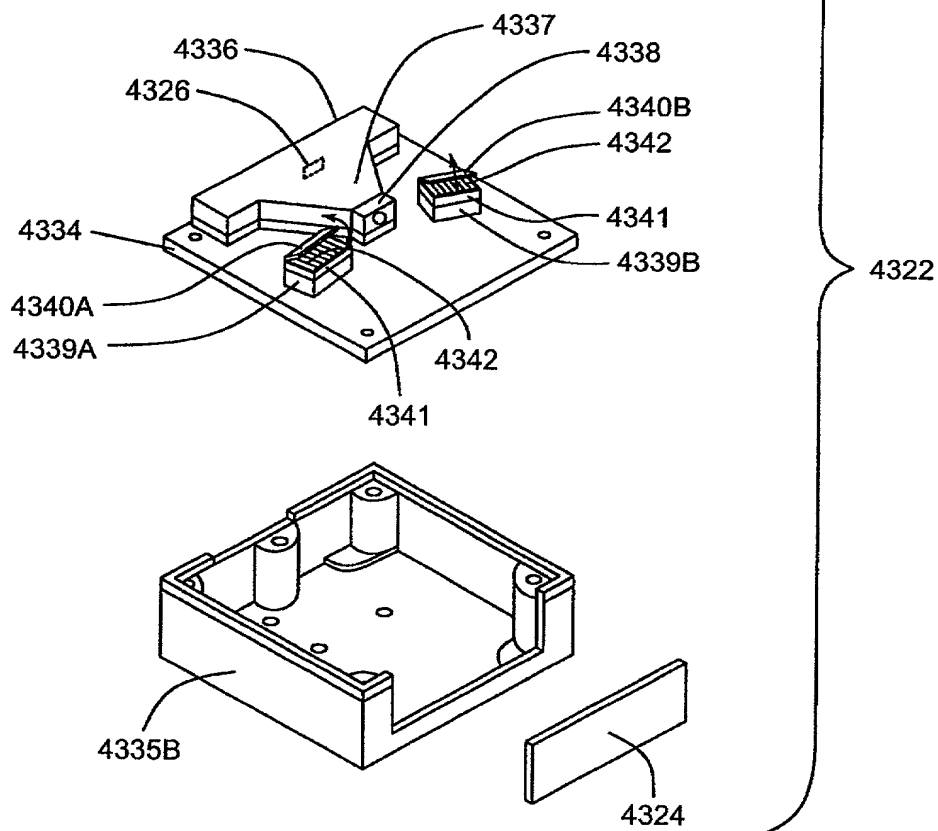
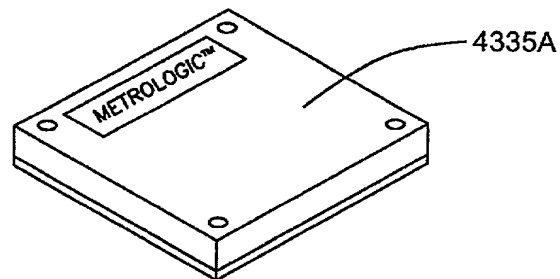


FIG. 62A



Micro-oscillating  
Spatial Intensity  
Modulation Panels  
Fig. 1I21A-21D

FIG. 62B

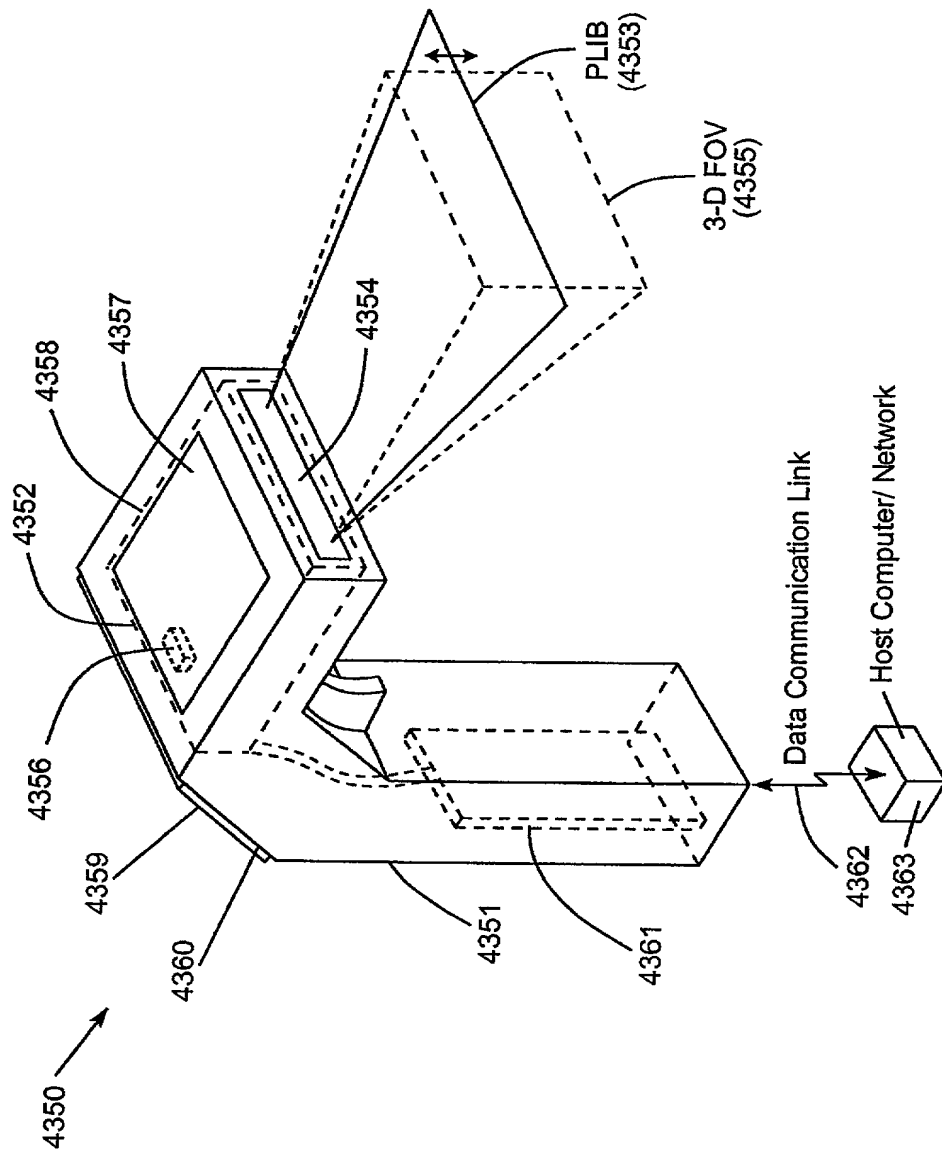
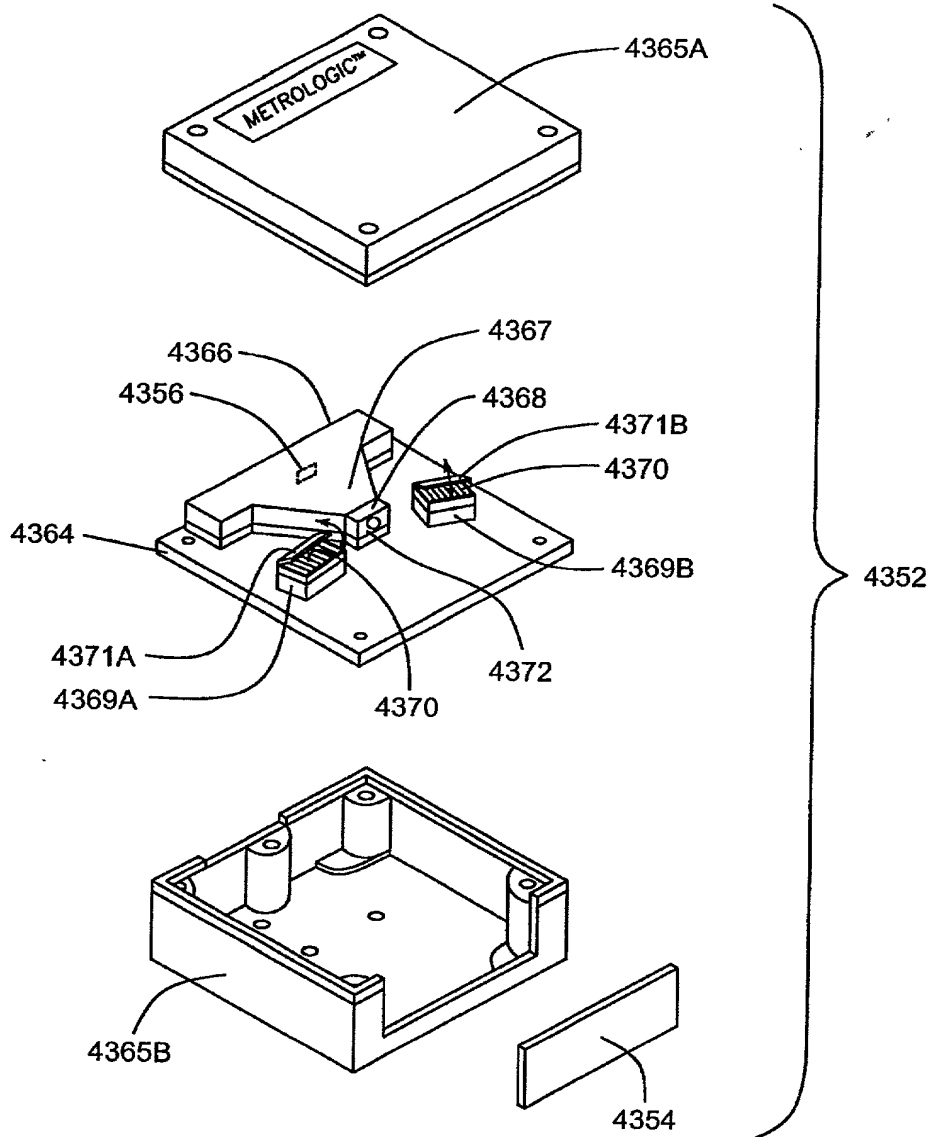


FIG. 63A



EO or Mechanically  
Rotating Iris

Fig. 1123A-23B

FIG. 63B

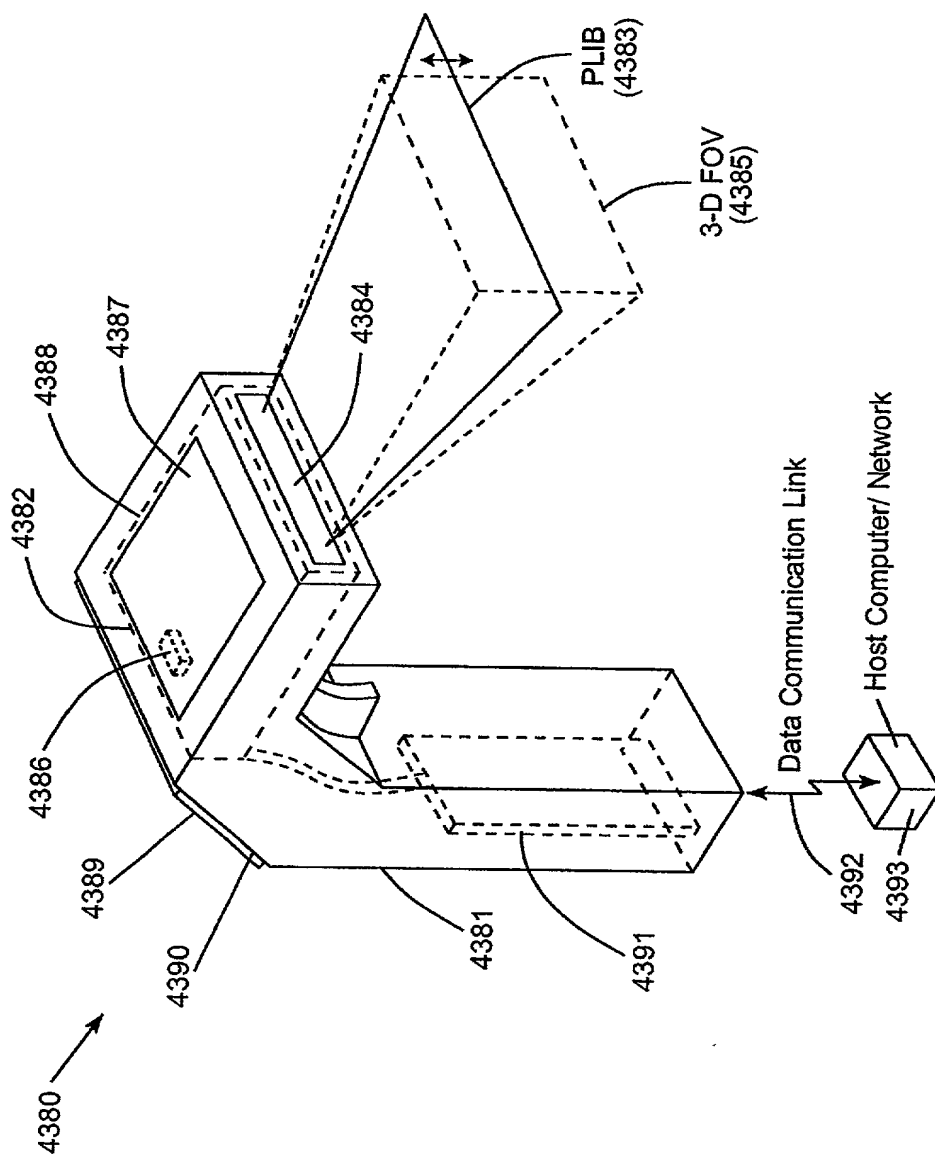
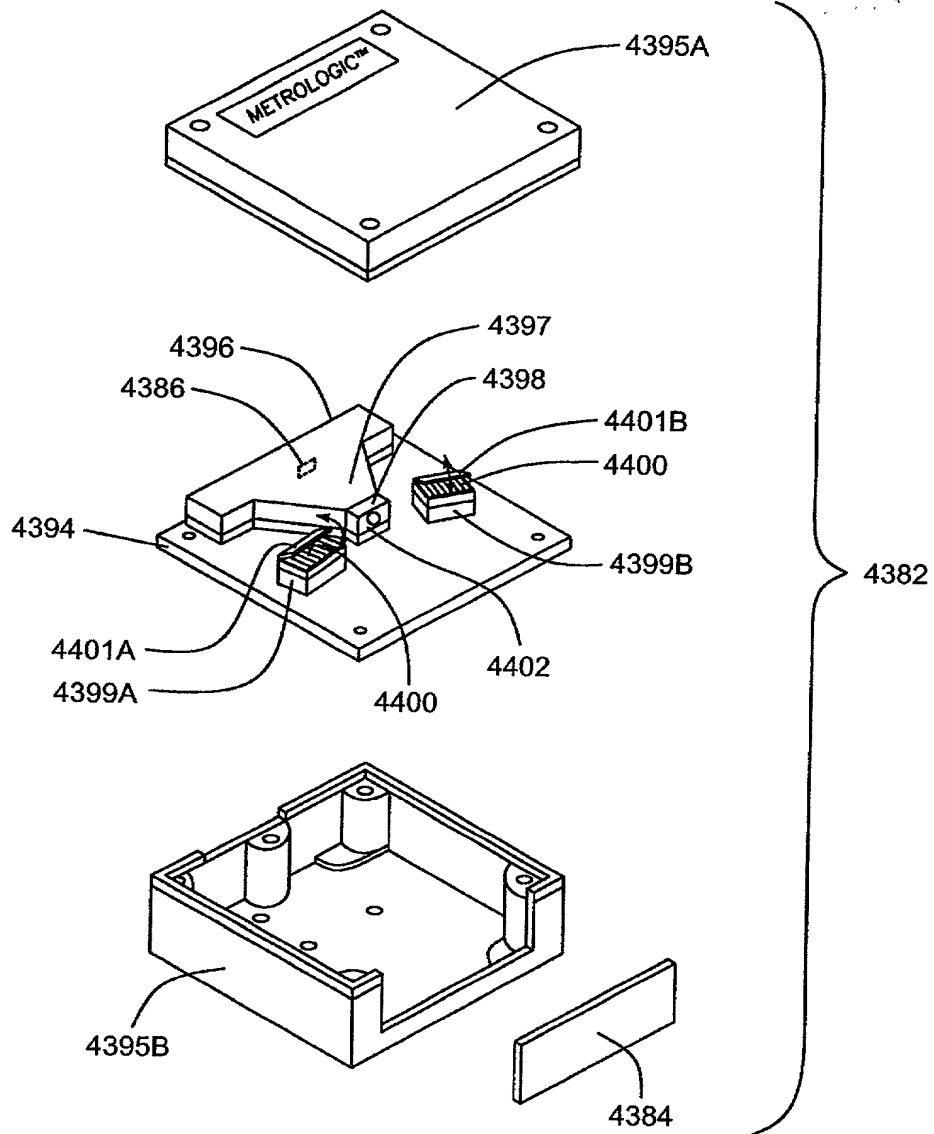


FIG. 64A



E-optical Shutter  
Before IFD Lens  
Fig. 1124A

FIG. 64B

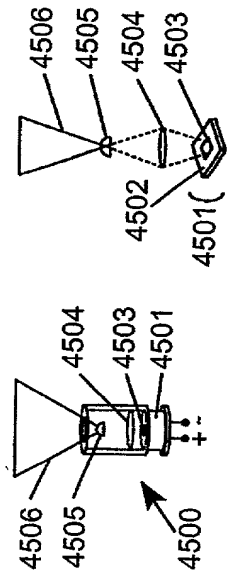


FIG. 65A

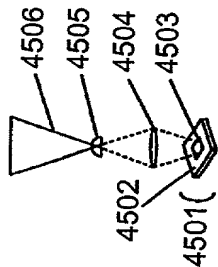


FIG. 65B

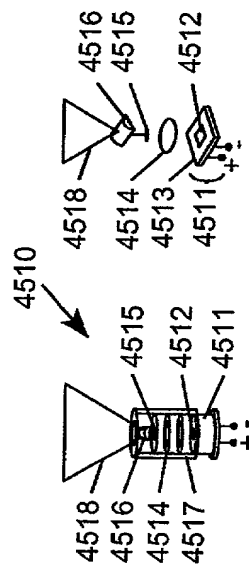


FIG. 66A

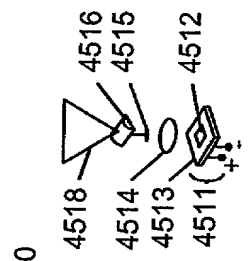


FIG. 66B

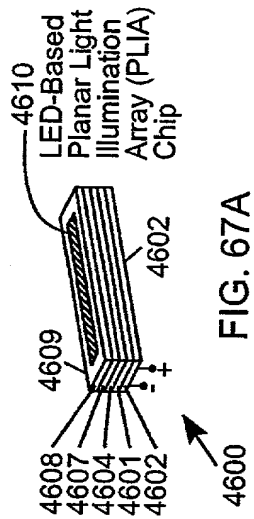


FIG. 67A

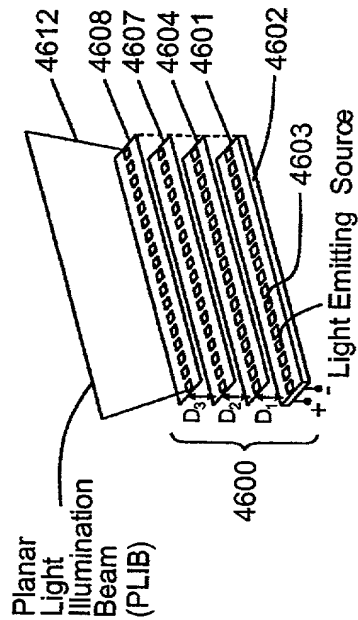


FIG. 67B

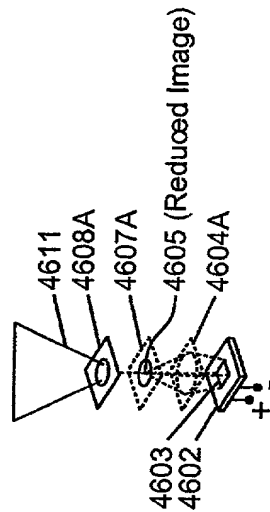


FIG. 67C



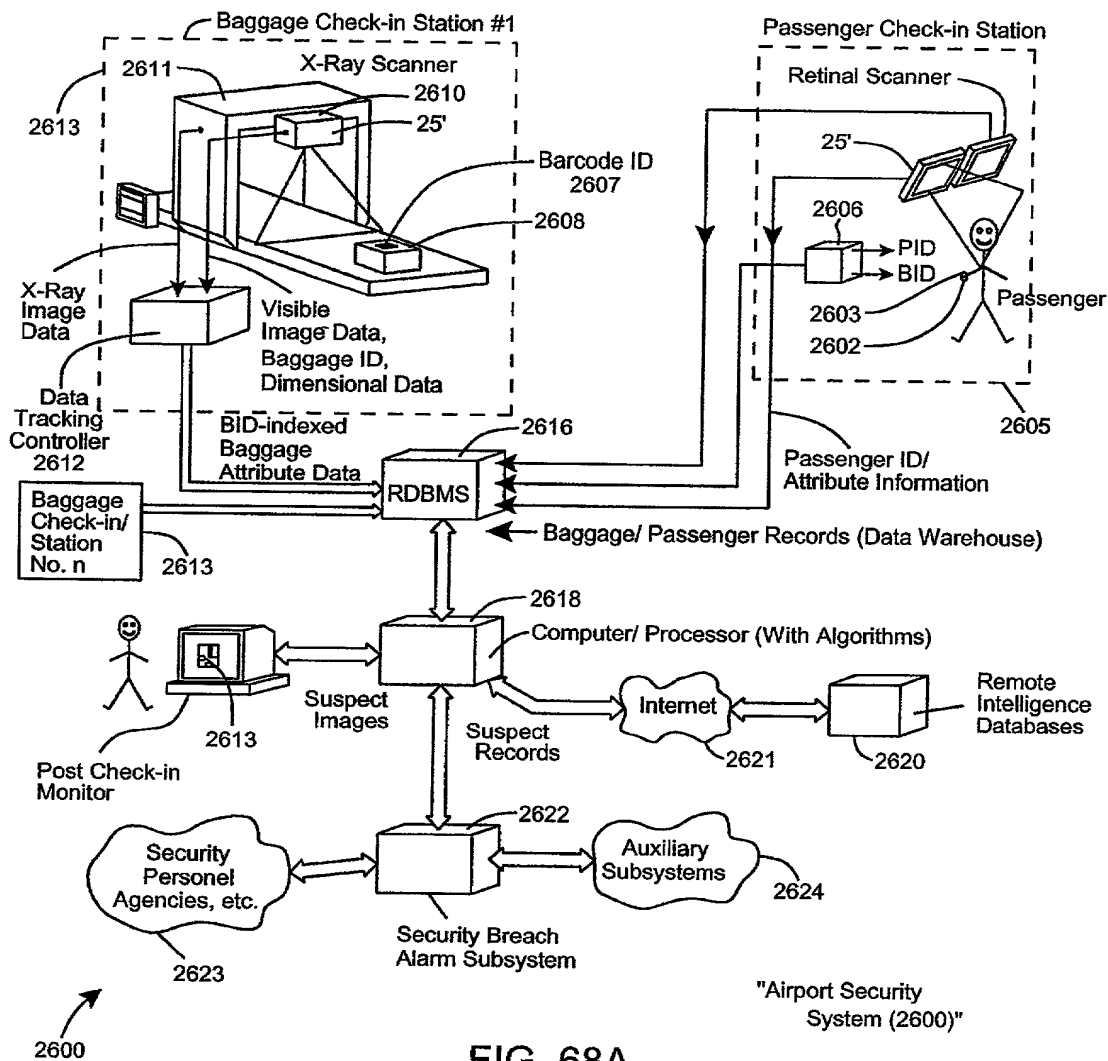


FIG. 68A

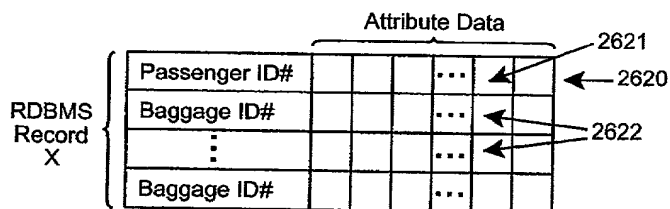


FIG. 68B